Gemini 4:4:4 User Manual

Current Firmware: Version 1.5.146

This is a Virtual Manual. As new firmware and features are released this manual will be updated. Please check back regularly or bookmark this link for reference.
Last Updated: 13-Feb-2013

http://www.convergent-design.com/Portals/0/Gemini444/Docs/Gemini444UserManual_v1_5_146_0213132.pdf

Contents

READ ME FIRST! 4

OVERVIEW 5

PACKAGE CONTENTS 5

FEATURES 6

GEMINI 4:4:4 ANATOMY 9

MENU STRUCTURE 10

GEMINI 11

SETUP 12

RECORD 13

INPUTS 13

OUTPUT 14

Enable/Disable Options 15

MENU QUICK KEYS 16

PREPARATIONS 18

TIPS, TECHNIQUES & RECOMMENDATIONS 18

POWER 20

AC Power Supply 20

Camera 20

REGISTRATION 21

ARRIRAW & Stereo 3D Options (Paid Upgrade) 21

Upgrade Instructions 21

SETTING DATE & TIME 21

SETTING METADATA 22

DPX HEADER METADATA 22

ARRI METADATA 22

XML FILE 22

FORMATTING SSD CARDS 23

SSD Status Indicators 24

System Status Indicators 24

RECORDING 25
Recording Time / Media 25
Frame rates of 48p and above require two SSD's (256 GB or 512 GB). 25
Recording Instructions 26
DPX 26
WAV 27
ARI 27
PLAYBACK 28
TRANSFER 30
Transfer Station 30
Second Generation Universal Transfer Station 30
First Generation Transfer Station (eSATA) - DISCONTINUED 30
Convergent Design Universal Transfer Station Instructions 30
Setup 30
Performance 31
File Support 33
File Structure 34
Transfer Configurations 35
POST WORKFLOW 40
DPX Files 40
ARRI ARRIRAW Files 45
XML Files / Metadata 52
APPENDIX 53
Firmware Updates 53
Firmware Update Instructions 53
Specifications 57
Gemini Mechanical Drawings 58
Remote Connector Pinout 58
Best Practices for Handling SSD Media, BNC Cables and Power 59

RELEASE NOTES 64
Firmware Version 1.4.100 16-November-2012 64
Previous Firmware Releases 73
Firmware Version 1.3.105 23-October-2012 73
Firmware Version 1.3.100 22-October-2012 75
The following Features for Firmware 1.2.100 still apply. 77
Firmware Version 1.2.100 10-September-2012 77
Canon 4K Cinema Raw Support 89
Trouble Shooting & Support 90
Limited Warranty 91
Obtaining an RMA 92

READ ME FIRST!

Before you begin using Gemini 4:4:4, we strongly suggest you review the included Quick Start Guide, as well as:

1. Always record to the **INTERNAL MEDIA OF THE CAMERA**; this is critical for proper timecode and ideal for dual media / backup.

2. **DO NOT PULL POWER OR MEDIA** (SSD, SxS, CF) from the unit or your camera during record or playback; This may result in data that is unrecoverable.

3. Power and Cabling: Make sure you have **PROPER POWER (6-19V DC)**, plugged in to the proper power spigot (left side of recorder), and that 3G-rated SDI cables are used.

4. Familiarize yourself with the equipment and test prior to shooting.

5. Before using the SSD's it is **IMPERATIVE TO FORMAT** them in the Gemini 4:4:4. Formatting SSD media is a **DESTRUCTIVE PROCESS**; all existing data will be lost during format.

6. Ensure that the camera's viewfinder data is not being recorded; **IF YOU SEE VIEW FINDER DATA ON THE GEMINI 4:4:4** monitor, then it will be recorded!

7. **NEVER DELETE ANY FILES OFF AN SSD FROM A COMPUTER**, except when going through a firmware update procedure.

8. While we recommend that you always maintain the latest firmware on your Gemini 4:4:4, we **DO NOT RECOMMEND UPDATING IF YOU ARE IN THE MIDDLE OF A SHOOT**.

9. When offloading media, **ALWAYS MAKE A BACKUP COPY**, ideally to a RAID1.

10. **GENLOCK YOUR CAMERAS**; this is recommended in all multi-cam shoots, and critical in 3D.

11. Ensure to allow Gemini to finish closing a Record file before taking any further action.

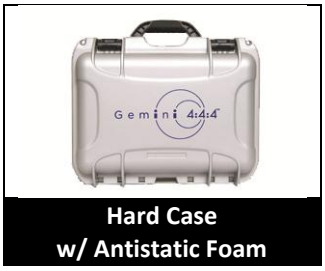
WARNING! WARNING! WARNING!

Use a Convergent Design AC-Powered Transfer Station ONLY! Do not use the first generation USB-powered, or any other USB-powered transfer station. Do not use any other 3rd party transfer station; this could compromise the data on your SSD media.

OVERVIEW

PACKAGE CONTENTS

Make sure you have the following items, supplied with your Gemini 4:4:4 upon purchase.



Hard Case w/ Antistatic Foam

Gemini 4:4:4 Uncompressed Recorder

Universal Transfer Station*

HDMI Type C to Type A

HD-SDI (Qty 2)

Universal AC Power Supply

Power D-Tap 4-Pin

XLR Power Cable 4-Pin

Hot Shoe Mount

Seagate GoFlex USB 3.0 Adapter

Stylus & Microfiber Cloth

DC – DC Converter
(incl. w/ ARRIRAW Option)

*AC Powered eSATA Transfer Station also available, see page 31. Request yours here: http://convergent-design.com/Products/Gemini444/GeminiTransfer.aspx

IT IS IMPERATIVE TO NOTE:

Only Convergent Design SSD's will work in the Gemini 4:4:4. These SSD's, available in 256GB and 512GB, must be purchased separately. Your Gemini 4:4:4 dealer is an ideal place to purchase these1.8" SSD's.

FEATURES

The Gemini 4:4:4 is a professional, high-definition video recorder that fits in the palm of your hand and is easily mountable on your camera. It is very light weight and small in size.

Gemini 4:4:4 functions as a high-quality monitor, with a wide viewing angle, high brightness with great contrast, and no compromise video playback device.

The footage from the Gemini 4:4:4 can be easily incorporated into virtually any workflow using your favorite codec or as native uncompressed DPX sequences.

With an extra cost option, Gemini 4:4:4 is also capable of recording, combining, and playing back 3D video.

The Gemini 4:4:4 records to specially certified and tested 1.8" solid-state hard drives that can be purchased from Convergent Design through your local dealer.

UNCOMPRESSED 4:4:4 RGB, 10-Bit, AND 12-Bit QUALITY

The Gemini 4:4:4 records in the highest quality possible; no other recorder exceeds the image quality of the Gemini 4:4:4!

The Gemini 4:4:4 records Full Uncompressed 4:4:4 RGB and also accepts 4:2:2 camera signals. This ensures that 100% of the quality of your video signal will be maintained. There are no signal losses, no artifacts, and no loss of quality whatsoever.

This is especially important when recording Log video, such as Sony S-Log or LogC. The precise values for each bit are recorded. No bit values are changed in any way, thus preserving the full integrity of your images. Recording full 4:4:4 is the proper way to record S-Log and Log-C. Recording 4:2:2 from a 4:4:4 capable camera is a compromise.

ARRIRAW OPTION (paid firmware upgrade)

Gemini 4:4:4 is ARRI Certified, supporting ARRIRAW (.ari) 2048 x 1650, up to 60fps from any ALEXA model camera 16:9, and supports 4:3 up to 48fps with desqueeze. Supports full raster live debayer monitoring and playback, including LUT support. No new hardware, no new SSD's required – simple firmware update with paid upgrade.

CANON 4K CINEMA RAW OPTION (paid firmware upgrade)

Canon Cinema Raw (.rmf) support for Canon C500, up to 60fps for 4K, 120fps 4K half-raw, and 120fps HD. Includes 4K, Quad HD, Raw, Half Raw, 2K, 12-bit (1080p) and 10-bit support. Full raster debayer monitoring and playback (up to 60fps)

STEREO 3D SUPPORT (paid upgrade)

Gemini 4:4:4 supports 3D DPX Record/Play with multiple Combining options and Horizontal Flip options from 2 Gen-locked cameras up to 1080p30. Combining applies to Live Preview or Play, for Record the 2 Video Streams are recorded separately (without combining). Horizontal Flip of Left or Right Channels, applies to Live Preview *and* to recorded data. Live/Record Horizontal Flip of Left or Right Channels options are available via menu items:

Outputs-> HFlip Left	Horizontal Flip of Left Channel to LCD / Outputs and applied to Recorded Data
Outputs-> HFlip Right	Horizontal Flip of Right Channel to LCD / Outputs and applied to Recorded Data

Combining Features for Preview/Playback include:

- Side By Side
- Line By Line
- Anaglyph
- 50% + 50%
- Left – Right Luma
- Right – Left Luma

Choose any of the above for the built-in LCD and HD-SDI A Output. A separate choice may be selected for the HD-SDI B Output.

DUAL-CHANNEL RECORDING (via 3D Option)

With the 3D Option, you are able to record two cameras simultaneously; Camera 1 to SDI A and Camera 2 to SDI B. Depending on your settings, you can see both channels for preview/playback, one separately, or Camera 1 on the Gemini and Camera 2 out to a monitor. *Cameras MUST be gen-locked.

4:2:2 to 4:4:4 UP-CONVERSION

The Gemini 4:4:4 records in DPX file format, an industry standard for high end post processing. To conform with widely used software that accepts the DPX file format, the Gemini 4:4:4 automatically up-converts (up-reses) to 4:4:4.

This is accomplished by using a sophisticated routine that uses the weighted average of nearby pixels to ensure that the 4:4:4 is of high quality, even when the source video is 4:2:2.

PLEASE NOTE:

The Gemini 4:4:4 will record from either a 4:2:2 or 4:4:4 camera.
A 4:2:2 signal will be up-resed to 4:4:4.

SPECIAL RECORDING CAPABILITIES

Time-Lapse, Vari-Frame, Project Frame Rate and high frame rates (up to 60fps) are all supported.

HD TOUCH SCREEN FOR RECORD AND PLAYBACK

The Gemini 4:4:4 is easily controlled using the touch screen. A Stylus is provided to prevent the LCD Monitor from being smudged.

DUAL SSD

The Gemini 4:4:4 is unique in that it supports two SSD's for both recording and playback. To extend recording time, a recording can automatically span from one SSD to another. This is fully automatic.

S-LOG and LOG-C SUPPORT

Many features are built into the Gemini 4:4:4 for supporting Log footage:
A menu option easily allows one to apply a built-in LUT (Lookup Table) to native S-Log footage.
The LUT is applied to the LCD and HD-SDI outputs.

LOG RECORDING

The Gemini 4:4:4 is ideally suited for recording Sony S-Log, ARRI C-Log, and will support Canon Log-C.

SINGLE LINK 3G & DUAL LINK 1.5G/3G

The Gemini supports both single link 3G and dual link 1.5Ghz HD-SDI Input for 4:4:4 and ARRIRAW recording, as well as Dual 3G for recording ARRIRAW 16:9 48p, 50p, and 60p (4:3 support up to 48fps). Note: Canon Raw 2K 1080 formats only require 3G single link.

HIGH PERFORMANCE SSD'S

The Gemini 4:4:4 SSD's are specially picked for their performance and reliability. These SSD's are capable of read speeds of 500 Mbytes/sec, making transfer of files very quick. You'll find these Convergent Design SSD's available through our Dealers at affordable rates.

FAST BOOT TIME

You can expect your Gemini 4:4:4 to power up and be ready for recording in approximately 12 seconds or less after applying power.

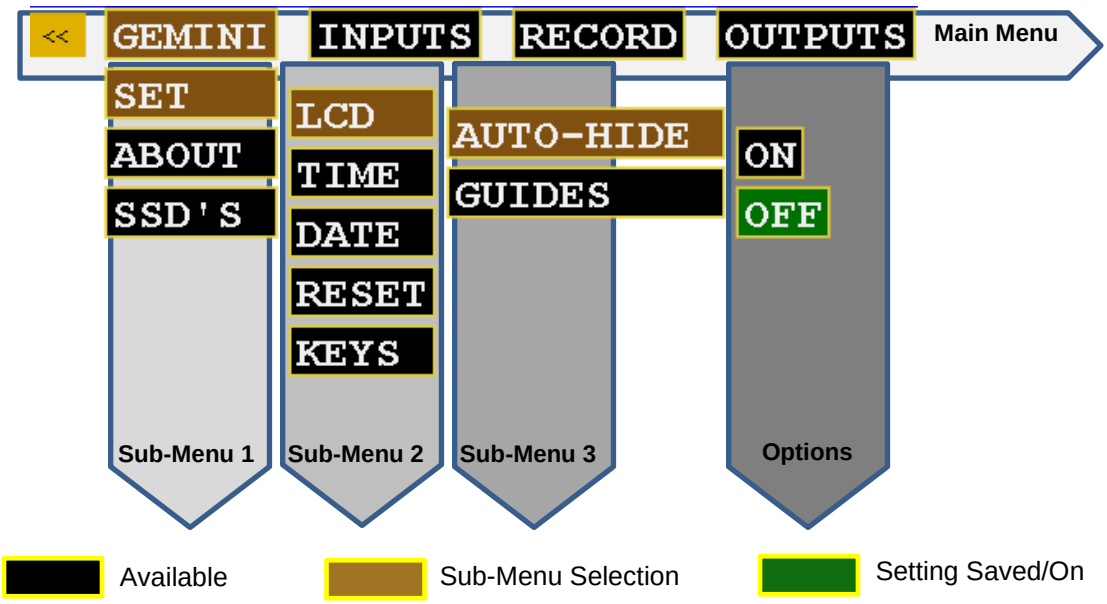
GEMINI 4:4:4 ANATOMY

WARNING! DO NOT ENCLOSE THE UNIT IN AN AIRTIGHT CONTAINER

Keep the area around the cooling fins (vertical lines on the back of the Gemini) open for air flow. Unit temperature must not exceed 65*C. Gemini 4:4:4 and SSD's will operate at full potential under these conditions. Keep the unit vertical for bet cooling.

MENU STRUCTURE

The Gemini 4:4:4 menu can be accessed through the buttons along the top of the screen. By tapping on a Main Menu heading, a Sub-Menu 1 navigation will appear. Likewise, by tapping a Sub-Menu 1 heading, a Sub-Item 2, and so on, may appear and subsequently provide you with an Option related to that.



GEMINI

Sub-Menu 1	Sub-Menu 2	Sub-Menu 3	Option	Description	Additional Information
SET	LCD	Auto-Hide	On	The on screen menu will disappear after 15 seconds of idling. Touching the screen anywhere will bring the menu back.	
			Off	The on-screen menu will always be displayed unless the hide button is touched.	
		Guides	2.39:1		
			1.85:1		
			None	Removes any current Guides setting.	
		Flip	On	Flip the video and on-screen display by 180˚.	Great for certain mounting options. Note: THIS DOES NOT FLIP THE RECORDED IMAGE!
			Off	Flip the video and on-screen display to normal view.	
		Brightness	→	Adjustable in 10% increments. Click OK to save selection.	
	Time	→	→	Set the appropriate time.	
	Date	→	→	Set the appropriate date.	
	Reset	Menu	→	Restore all default settings.	
		Metadata		Resets metadata fields	
	Keys	Unit	OK	Indicates your product was successfully registered.	Requires nothing further after initial registration.
		ARRIRAW ARRI		To activate ARRIRAW feature, enter key code (available with purchase).	Raw is available in Demo Mode without purchase. Image will have permanent watermark.
		3D		To activate Stereo 3D feature, enter key code (available with purchase).	3D is available in Demo Mode without purchase. Image will have permanent watermark.
		Canon Raw		To activate Canon 4K Cinema Raw feature, enter key code (available with purchase).	Canon Raw is available in Demo Mode without purchase. Image will have permanent watermark.
SSD's	Format SSD 1	→	→	Permanently erases everything on SSD 1.	**WARNING: DATA WILL NOT BE RECOVERABLE!**
	Format SSD 2	→	→	Permanently erases everything on SSD 2.	
	Format Both	→	→	Permanently erases everything from both cards.	

	Recover SSD1	→	→	Non-destructively recovers/rebuilds file system of SSD drive 1	Use only in extreme cases (such as if a computer corrupts the SSD's file system).
	Recover SSD2	→	→	Non-destructively recovers/rebuilds file system of SSD drive 2	
ABOUT	→	→	→	Displays the firmware version, serial number of your Gemini unit, warranty date, and activated keys.	

SETUP

Sub-Menu 1	Sub-Menu 2	Sub-Menu 3	Option	Description	Additional Information
MODE	→	→	DPX	Gemini records and plays 4:4:4 DPX files, requiring a video input of 1080p 4:2:2 or 4:4:4 up to 30p, 4:2:2 input up to 60p	
			ARRIRAW	Gemini records and plays ARRIRAW files, requiring a video input of ARRIRAW 16:9 up to 60p, or ARRIRAW 4:3 up to 48p. See Release Notes at end of this document for more details	**Note: Project Frame Rate cannont be set below; Frame Rate from Camera.**
			3D DPX	Gemini records and plays 4:4:4 DPX files, requiring dual gen-locked video input of 1080p 4:2:2 or 4:4:4 up to 30p. See Release Notes at end of this document for more details	**Note: Project Frame Rate cannont be set below; Frame Rate from Camera.**
			Canon Raw	Records and plays Canon Cinema Raw .rmf files up to 60p.	Some recording rates and flavors require the use of 2 Gemini's; See page 73.
PROJECT	Frame Rate	**Only in MODE > DPX**			
		Follows Input		Set Project Frame Rate, will be the frame rate in recorded files.	This allows the Playback Frame Rate (the Project Frame Rate) to be different from the Video Input / Recorded Frame Rate
		23.98		Marks files for 23.98p playback	With this enabled it marks the files for selected playback rate regardless of incoming format, creating a crank effect. IE 60p input and 24p Project Rate is 2.5x slower playback. Can be faster or slower.
		24.00		Marks files for 24p playback	
		25.00		Marks files for 25p playback	
		29.97		Marks files for 29.97p playback	
		30.00		Marks files for 30p playback	

RECORD

Dropdown	Sub-Item	Sub-Menu 3	Option	Description	Additional Information
TRIGGER	Rec Button	→	→	Recording is started by touching the record button on the Gemini screen.	
	Camera ARRI	→	→	The record trigger is provided by the camera. **ARRI NOTE: MEDIA MUST BE PRESENT (v5.0). ALEXA firmware v6.0 and newer, SYS can be disabled.**	Compatible cameras include Canon C300, XF305, Sony F3, ARRI ALEXA (via SDI Remote camera setting).
	Timecode				
	Remote				
CLIP	**DPX** (Clip Name)(Clip #) **(AAAAAAAA)(000)**	→	→	Allows the user to set the name of the recorded files.	The last three digits will auto-increment from one recording to the next. If you are using more than one Gemini unit, it is recommended that at least the first two characters of this name be set different from one Gemini unit to the next.
	ARRIRAW REC BUTTON TRIGGER (Clip Name)(Clip #) **(AAAAAAAA)(000)**			The file name is set on the Gemini.	
	ARRIRAW / Canon Raw CAMERA TRIGGER (Clip Name)(Clip #) **(AAAAAAAA)(000)**			The file name is provided by the camera.	It is best to simultaneous record in camera. Information is received via SDI from the camera. Note: if the Next Reel is not available from the ARRI, the Gemini Recorder will create the Next Reel.
SPECIAL	T-Lapse	Set	On		This option available only in DPX Mode.
			Off		
		Sec		If Time-Lapse is enabled, this setting determines how often to record a single video frame during a record session, is seconds.	
EXTCLIP	Canon Raw Only	On		When pulling clip-naming from the camera use long clip name (base name + date & serial number)	Note: C500 does not provide clip-name when in slow/fast.
		Off			

INPUTS

Sub-Menu 1	Sub-Menu 2	Sub-Menu 3	Option	Description	Additional Information
TIMECODE ARRI	Source	→	SDI	Timecode is extracted from the SDI signal coming from your camera.	For non-zero timecode, set your camera's timecode output (if it has one).
			LTC	LTC to 6 pin via remote port and adaptor cable.	**ARRI: Not supported in ARRIRAW**
AUDIO ARRI	Channels	→	2	Embedded Audio (SDI)	2 Channels Supported. **ARRI: No audio provided at p48/50/59.94/60.**

OUTPUT

Sub-Menu	Sub-Menu 2	Sub-Menu 3	Option	Description	Additional Information
REC TALLY	On	→	→	When the Gemini is recording, the SDI and HDMI output will display a red bar on the bottom of the screen to indicate an active record. When ready to record, a green bar will appear.	This red bar is not recorded in the Gemini. If you are using a separate recorder to record the output of the Gemini, turn this setting off.
	Off	→	→	Nothing will be overlaid on the SDI or HDMI output of the Gemini.	
MODE	4:2:2	→	→	SDI output as 4:2:2; works in both Rec and Play Mode.	This setting only affects the output video. 4:2:2 Input will always be converted to 4:4:4 for recording.
	4:4:4	→	→	Incoming video will be output as 4:4:4.	Use this setting if you want to output 4:4:4 RGB, usually Dual Link HD-SDI. (Not valid with 4:2:2 input)
Legalized ARRI	On	→	→	ARRI ONLY LCD/Output display has legalized values.	
	Off	→	→	ARRI ONLY Full range values for LCD/outputs	
LCD/A 3D	→	→	OFF		
			SXS	Side by Side	
			LXL	Line by Line	
			ANAGL	Anaglyph	
			50/50	50% + 50%	
			L-R	Left – Right Luma	
			R-L	Left – Right Luma	
OUT/B 3D	→	→	OFF		
			SXS	Side by Side	
			LXL	Line by Line	
			ANAGL	Anaglyph	
			50/50	50% + 50%	
			L-R	Left – Right Luma	
			R-L	Right – Left Luma	

Vari-Frame Support

Gemini 4:4:4 auto-detects Vari-Frame mode from the ARRI ALEXA, and records only the Vari-Frame video frames. A “Vari-Frame” tag will be displayed on the LCD during Live Preview.

(**Note: When using Vari-Frame, if the ALEXA's Sensor rate is ever changed, cycle all video inputs to the Gemini before proceeding.)

(**Note that the Live Preview on the Gemini of Vari-Frame data will not look as expected. The Gemini plays the last 1 second of captured Vari-Frame frames, so that the video and timecode will appear to repeat over a 1-second interval.)See Release Notes at end of this document for more details.

If “Sensor Rate” on the ALEXA = 30 or less, “Rec Out” must = 30 or less.
DO NOT set “Sensor Rate” to less than 1.
DO NOT set “Sensor Rate” to 23.98 and “Rec Out” to 24.
DO NOT set “Sensor Rate to 29.97 and “Rec Out” to 30.
“Sensor Rate” must be less than, or equal to, “Rec Out.”

Enable/Disable Options

Enable ARRIRAW / 3D / Canon 4K Cinema Raw

In order to enable the ARRIRAW feature (not in Demo Mode), you must purchase the ARRIRAW Upgrade to the Gemini 4:4:4 unit. The purchase is facilitated through your local dealer. Convergent Design will provide you a unique key to activate your unit. For more details about Upgrade Procedure, see page 44.

Disable ARRIRAW / 3D / Canon 4K Cinema Raw

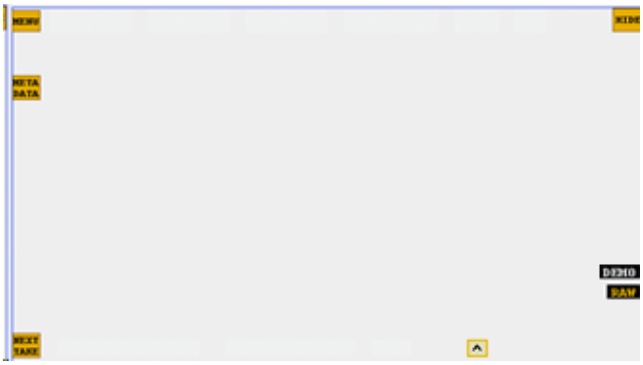
Activated ARRIRAW feature can be disabled / enabled. To disable ARRIRAW (back in Demo Mode):

1. On the Gemini, go to Gemini > Keys > Raw
2. Tap the Key’s field “OK”, the text will change to “SET DEMO”, tap again, text will change to “0000DEMO.” Enter 4 digit Demo password (available upon request from Convergent Design). ARRIRAW/3D feature is now in Demo mode.
3. To re-enable ARRIRAW, simply go to the Raw Keys field in the Menu, and enter the correct Activation Key (provided upon purchase of the ARRIRAW feature).

Canon C500 Slow/Fast Support (where 2 recorders are required)

Only the maximum slow/fast rate is supported. (Frame Record/Interval Record: not supported)

MENU QUICK KEYS



Menu
Click to reveal main menu structure. Click << to collapse.

Hide
Click to remove all content/buttons from the screen. Tap the monitor anywhere to reveal

SSD Safe Eject
Updates the file system and exposes recorded clips. Recommended: record all clips before safely ejecting SSD's for offloading data. READ MORE, PAGE 18.

Metadata (Rec Mode) / Playlist (Play Mode) PLAY LIST
See Preparations: Setting Metadata page 18 for more information on Metatdata.
See Playback page 24 for more information on Playlist.
Set metadata prior to record.

ARRI (Rec Mode, Replaces Metadata Key) ARRI
ONLY IN RAW MODE: Click to reveal metadata (sent from camera; not editable data).

Next Take
Click to reveal Clip, Scene and Take info. Click << to collapse.

Demo DEMO
Displayed when in Demo Mode (recorded video is watermarked).

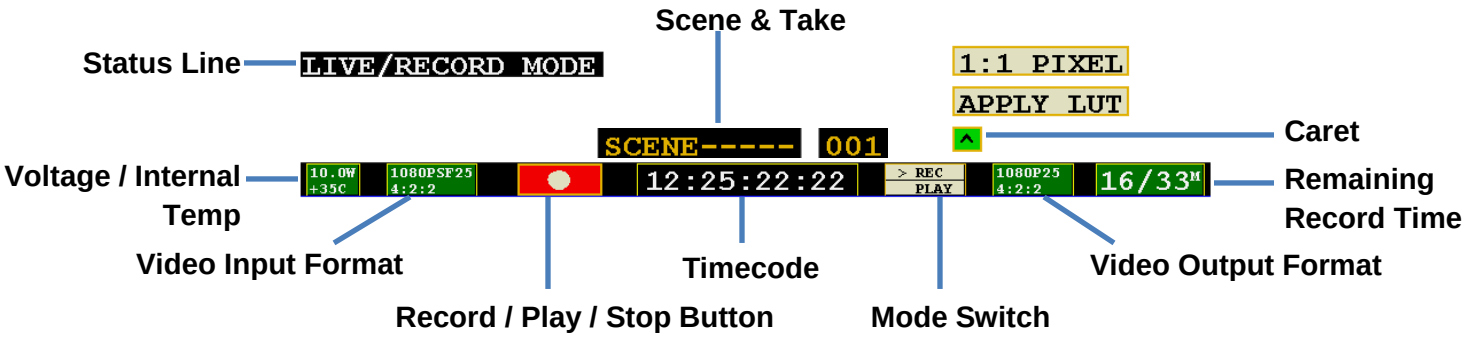
MODE
Corresponds to setting from Setup > Mode (ie DPX, 3D, .ARI, .RMF)

Tags
Corresponds to special modes (ie Timelapse, Slow & Fast, Variframe)

SSD INFO
Graphically display the space used / space remaining on each of the SSD's. Tap the graphical display to bring up a Status Box with more specific information about each SSD.

MODE TOGGLE & STATUS

Across the bottom of your Gemini monitor you will find the Control Bar, including Mode Functions and related Indicators and Buttons.



		Description
Status Line		The status line will indicate when you have successfully changed or applied a setting.
Record / Play / Stop Button		Click to initiate the appropriate action. Record Stop Play Pause
Scene & Take		Scene name set in Metadata; Take auto-increments from one record to the next. SCENE----- 001
Timecode		12:25:22:22
Mode Switch		Tapping will move the arrow (“>”) to toggle between Rec and Play Mode. > REC PLAY
Remaining Record Time		Remaining record time per card, shown as SSD1 / SSD2.
Quick Key		Click the caret to display options, then click to apply.

Apply LUT	Viewing LUTs are not applied to recorded material for incoming LOG data (4:4:4 input only).
1:1 Pixel	For critical focus.
IN RAW MODE: ‘Apply LUT’ is a Rec709 Generic LUT. Without a LUT applied video is in Log-C format.	
Desqueeze	ARRIRAW 4:3 only; displays the video in a 2.66:1 aspect ratio, which approximates the 2.39:1 aspect ratio from an anamorphic lens on the camera. For Live Preview/Play viewing only- DOES NOT EFFECT RECORDED VIDEO. Note: Desqueeze is always turned off during recording.

PREPARATIONS

TIPS, TECHNIQUES & RECOMMENDATIONS

The Gemini 4:4:4 is a sophisticated, technologically advanced device. A few simple tips, techniques and recommendations can help ensure a successful shoot.

1. ***Register your unit now, as you need access to the Internet to do so.***
   It must be registered. Otherwise the unit is disabled.
2. Obtain the Gemini 4:4:4 and all the necessary batteries, chargers well in advance of your shoot. Please be certain to plug the power cable into the power input, which is on the left side, the remote control connector is on the right side. Forcing the power connector into the remote control connector will damage the Gemini 4:4:4.
3. Obtain genuine Convergent Design SSD's. No other SSD's will work in the Gemini 4:4:4. This is to ensure that the SSD's are fast enough and have been fully tested prior to your shoot.
4. Extra, high quality HD-SDI cables are very desirable and should be available on every shoot. These must be good quality 75 Ohm cables with true 75 Ohm connectors. SDI cables rated for 3G SMPTE 424M are always preferred.
5. Please read the manual, you will gain a lot of practical knowledge.
   The latest version is on our website:
   http://convergent-design.com/LinkClick.aspx?fileticket=CdmSeL04O18%3d&tabid=139
6. We generally recommend that you use the latest firmware.
   http://convergent-design.com/FirmwareUpdates/Gemini444.aspx
7. Test the unit and the SSD's, with your camera, in advance of the shoot.
   Setup your camera, exactly as you will for the shoot, setup the Gemini 4:4:4,
   create some test footage, and run this test footage through your Post workflow.
   Ensure that your Post department can handle the full uncompressed workflow.
   Full uncompressed video is great, it is just different. Many systems support DPX and ARRIRAW, but not all. Please see the Workflow page on our website.
8. For editing DPX Files using Final Cut Pro, please obtain GlueTools.
   http://gluetools.com/products.html Select "Cineon/DPX Pro for Final Cut Studio".
9. Obtain a way to back up your data in the field. A good backup procedure is to have two backups, stored on separate devices, and have all of your footage checked visually, prior to reformatting and reusing the SSD's.
10. Purchase enough SSD's, plus some extras. Be certain that you have enough so that you can shoot while the backups are being made and the footage is being checked.
11. While shooting, during breaks, playback you footage, from within the Gemini 4:4:4 to check that everything is working fine. But, more importantly, transfer you footage to a backup, then play the footage from the backup to ensure that all is good!
12. Feel free to call, Skype or email Support 24/7. We strive to provide world class support. If you don't reach us at one number, try another.
    Support Contact Info: See Page 40.
13. Ensure that camera viewfinder data is not being sent to the Gemini 4:4:4.
    Record a test, and then play it back. If you see viewfinder data while you are recording, or on playback, please turn off OSD (On Screen Display), otherwise this will be recorded in your files.
14. Do not use Beta firmware for production work!

15. Do not over-tighten the ¼" x 20 or 3/8" x 16 screws. You can damage the case.
16. Please do not open the Gemini 4:4:4 case, as this voids the warranty.
17. Here is a tip to help your shoot be a success:
    The most successful teams plan ahead, and check out all of their gear in advance.
18. Never format an SSD unless you are certain that the footage has been transferred, and checked. To be safe, wait until you have the footage in two places.
19. Never attempt to write files to the SSD, nor delete files off the SSD and then reuse the SSD in the Gemini 4:4:4.
20. It is acceptable to upload files from an SSD, using our Transfer Station, then reinsert the same SSD into the Gemini 4:4:4 so that you can continue shooting. But, as noted above, do not delete files off the SSD, then attempt to shoot more.
21. Always format the SSD's, in the Gemini 4:4:4.
    Formatting an SSD in another device is not acceptable.
22. Never put the Gemini 4:4:4 in a confined enclosure, it needs access to fresh air for cooling.
23. Never leave the Gemini 4:4:4 in hot sun without protection for an extended period of time. If it has been in a hot car, please allow time for it to cool.
24. Protect it from rain, splashes and other inclement weather.
25. Do not leave the Gemini 4:4:4 flat on a table with the power on.
    A vertical position is best as it allows air to flow naturally over the cooling fins.
26. Do not feed the Gemini 4:4:4 reverse-voltage DC, or voltages over 19 Volts.
    Do not plug in the Anton Bauer D-Tap or P-Tap connectors in backwards.
    Caution: Some non-Anton Bauer P-Tap power outlets allow the P-Tap or
    D-Tap connector to be plugged in backwards.
    If you do, then the Gemini 4:4:4 will stop working and it will have to be repaired.
27. Respect the Touch Sensitive LCD. Do not use hard objects to operate the touch screen.
    A ball point or other pen should not be used. Use our provided stylus or something similar.
    Caution: The Touch Screen and LCD are expensive to replace.

ARRI® Canon

28. For ARRI recordings using Camera Trigger, recorded .ari files base name will match ARRI ALEXA internal recording clip name, provided that the ALEXA and the Gemini are set to the same date.

ARRI® Canon

29. If set for 'Camera Trigger', make sure camera is not already recording (DPX or ARRIRAW).

POWER

There are multiple ways to power your Gemini 4:4:4;

1. Using the provided AC Power Supply which includes international power plugs
2. Using 4-Pin XLR Power, using the supplied 4-Pin XLR to 4-Pin Hirose Power Cable.
3. Using an Anton Bauer or IDX Battery with a D-Tap connection. A D-Tap to 4-Pin Hirose Power Cable is included.
4. Using any 4-Pin Hirose Power cable as provided by Convergent Design for Gemini 4:4:4 or nanoFlash.
5. Using any suitable DC power source, 6 to 19 Volts DC, with a 4-Pin Hirose connector.
   Pin 1 & 2 Must be Positive DC Voltage
   Pin 3 & 4 Must be Negative or Ground
   Power Supply must supply at least 20W.

WARNING! POWER INPUT IS LIMITED TO 6-19 VOLT DC.

Please check the voltage and polarity before using. You may also purchase our DC – DC Converter (ARRI users) or the Power Protection Module from your local Dealer.

AC Power Supply

Simply connect the 4-pin Hirose to 4-Pin Male XLR cable to the Female 4-Pin XLR connector on the AC Power Supply and plug into a suitable AC power source.

Gently turn to fit and click the Hirose connector into the Power 6-19V connector on the left of the Gemini 4:4:4.

Do not force the power connector into the Remote Tally connector on the right side of the Gemini 4:4:4.

Camera

Using the supplied HD-SDI cables, or other high quality True 75 Ohm HD-SDI cables with True 75 Ohm connectors, connect your camera to SDI A, or to both SDI A and SDI B (for Dual Link).

Use of 50 Ohm and/or low quality cables will cause the video signal to be intermittent.

In the event of power loss during record, the Gemini will automatically attempt to recover the last recorded clip (when power is restored and assuming that the same SSD's are inserted).

REGISTRATION

If you haven't already, you will need to register your Gemini 4:4:4 at www.Gemini444.com to activate your unit.

Your information is private and used internally to send you firmware updates via email. We highly encourage you to enter the optional information that we request. This extra information is designed to help us provide product improvements as well as better products for you.

When you power up the Gemini for the first time, it will automatically provide you with a serial number that you will need for your on-line registration, via the website.

1. Tap the OK button when you are ready to proceed.
2. Enter Unit Activation Key using the + and – buttons; Press OK.
3. Activation is complete if you have received the 'Unit Activation Successful' in the Status Line.

ARRIRAW, Canon 4K Cinema Raw, & Stereo 3D Options (Paid Upgrade)

All Options can be purchased through your local dealer. Convergent Design will then provide you an Activation Key. To input key and activate unit, go to Gemini > Set > Keys > Raw.

Upgrade Instructions

1. Purchase the Option from your local Dealer.
2. On the Gemini, go to Gemini > Set > Keys > Raw
3. With an SSD inserted into Slot 1, enter value "10000000" (eight-digit) for the Raw Key; press "OK".
4. A Unit ID File is written to the SSD. Using the provided transfer station, save this file to your computer.
5. Upon receipt of the Option order, Convergent Design will contact you to obtain necessary contact information and the Unit ID File. This information is used to process your unique Activation Key.

Convergent Design will provide the Activation Key to be entered into the Key field and activate the feature on the Gemini 4:4:4.

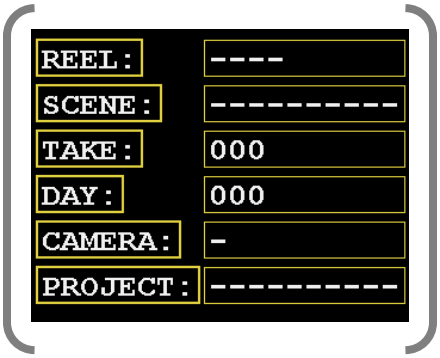
SETTING DATE & TIME

The Gemini > Set > Time and Gemini > Set > Date menu items are used to set the internal clock of the Gemini 4:4:4, which keeps time even when there is no external power connected to the unit. Make sure this matches your camera for internal recording as proxy.

SETTING METADATA

When Gemini 4:4:4 is in Rec Mode, you can edit Metadata.

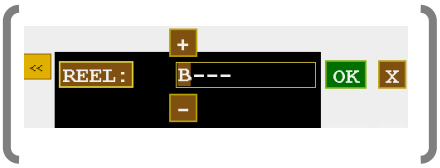
Tap the 'Metadata' Menu Quick Key to reveal the following editable data: Reel, Scene, Take, Day, Camera, and Project.



This information is stored until changed or power is removed.

Some of the metadata is displayed for each clip in Play Mode, including: Scene, Take, Timecode, Date, Time and Shooting Day.

To edit, simply tap the field you would like to edit, then tap the character field to reveal a character toggle. You may edit multiple fields before choosing OK to save your changes, or X to revert to previous.



DPX HEADER METADATA

During record, metadata is saved in various locations within the header of every DPX file. This data is viewable in some software on a computer. Additionally, the metadata is stored in a separate XML file alongside the DPX files for a given record.

File Field	Values for Data Input Included
DPX Slate Info	Reel, Scene, Take, Day
Input Device Name	Reel
Input Device Serial Number	Camera
Project	Project
IN ARRIRAW MODE: Metadata comes from camera; fields not editable.	

ARRI METADATA

All metadata when recording ARRIRAW comes from the camera, and must be set in the ALEXA camera.

CANON RMF HEADER METADATA

During record, metadata is saved in various locations within the header of every RMF file. This data is viewable in some software on a computer. Additionally, the metadata is stored in a separate XML file alongside the RMF files for a given record.

XML FILE

All metadata fields and additional clip information are stored for each recording. See more under Post Workflow, page 37.

HANDLING SSD CARDS - READ THE FULL SAFE HANDLING DOCUMENT

Avoid touching the connector end of the SSD's.

Avoid shocking the connector end of the SSD's via static electricity.

When inserting into the Gemini 4:4:4, make sure the label is facing the front of the unit (see the proper placement in the image below).

Please be gentle when inserting the card. Clasping the door over the card and gently pushing in the drawer will adequately connect the drive.

FORMATTING SSD CARDS

WARNING! WARNING! WARNING!

WARNING: BEFORE USING THE SSD'S IT IS IMPERATIVE TO FORMAT THE SSD'S IN THE GEMINI 4:4:4. ALL EXISTING DATA WILL BE LOST DURING THE FORMAT!

Formatting is a destructive process.
Any data on your SSD's that has not already been transferred to another medium will be lost forever. Once this process is started, there is no way to recover the data. "Un-format Utilities" will not be able to recover the data.

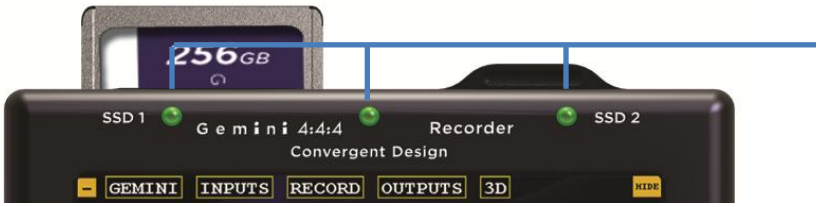
Go to **GEMINI > SSD's > FORMAT SSD1** or **GEMINI > SSD's > FORMAT SSD2 or FORMAT BOTH** from the Menu to format the SSD's.

This process will take approximately 30 seconds for a 256GB and 60 seconds for 512GB cards.

Initializing SSD Drives
If a SSD is removed from Gemini, Mac, or PC while still being accessed you may have to wait until the drive gets reinitialized in either the Gemini, Mac, or PC. This may take up to 5 minutes.

IT IS IMPERATIVE TO NOTE:

After the SSD's have been used to record any video, the video must be transferred to another device, before reformatting the SSD's, otherwise the video will be lost forever.



SSD Status Indicators

SSD Status Indicators

The LED lights associated with each SSD drive will display the following status color indicators:

- Drive needs to be formatted within the Gemini.
- Drive is completely full and can be played back or formatted for a new record.
- Drive is ready to record.
- SSD card is initializing.
- Drive is currently playing back.
- Drive is currently recording. **NEVER REMOVE SSD DURING RECORD OR PLAYBACK!**
- Powering Up; System Test
- Drive has old clips which can be played back but to record new SSD's must be formatted.

System Status Indicators

The LED lights located in between each SSD drive, in the middle of the unit, will display the following status color indicators:

- Ready for record.
- Recording. **IF FLASHING RED, SEE TROUBLESHOOTING BELOW.**
- Play Mode. **CURRENTLY PLAYING.**

SSD Firmware Updates

If an SSD update is available, a dialog will appear to update your SSD(s) (upon insertion of the SSD). Please perform SSD updates at your earliest convenience. Ensure that SSD data is backed up and that the Gemini has a reliable power source, before updating SSD's. This process takes about 30 seconds.

RECORDING

Recording Time / Media

Media	DPX					
	1080p 23.97/24	1080p25	1080p 29.97/30	1080p48	1080p50	1080p 59.94/60
256GB SSD (x1)	21	20	na	na	na	na
256GB SSD (x2)	41	40	33	21	20	na
512GB SSD (x2)	82	80	66	42	40	33

1080p48 not supported in Firmware 1.1.2

Frame rates of 29.97/30p and above require two SSD's (256 GB or 512 GB).

Frame rates of 59.94/60p require two 512GB SSD's.

ARRI

Media	ARRIRAW (.ari) 4:3 16:9					
	1080p 23.97/24	1080p25	1080p 29.97/30	1080p48	1080p50	1080p 59.94/60
256GB SSD (x1)	25	24	20	na	na	na
256GB SSD (x2)	50	48	40	25	24	na
512GB SSD (x2)	100	96	80	50	48	40

Frame rates of 48p and above require two SSD's (256 GB or 512 GB).

Frame rates of 59.94/60p require two 512GB SSD's.

It is recommended that you do not exceed 250 recorded clips per SSD.

Media	Canon Cinema Raw (.rmf)					
	1080p 23.97/24	1080p25	1080p 29.97/30	1080p48	1080p50	1080p 59.94/60
256GB SSD (x1)	21	20	na	na	na	na
256GB SSD (x2)	41	40	33	21	20	na
512GB SSD (x2)	82	80	66	42	40	33

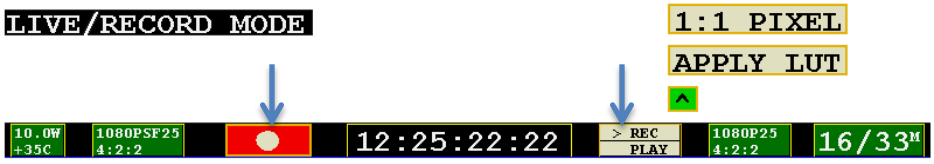
Recording Instructions

TROUBLESHOOTING: If the SSD Indicator(s) are NOT green, try the following

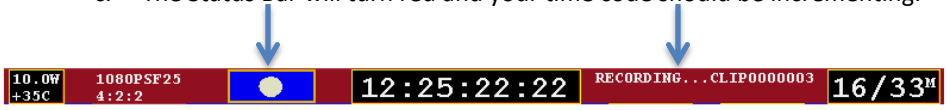
Orange	**SSD drive is initializing. If it does not change after 30 seconds (for 256GB)/ 60 seconds (for 512GB), power cycle the unit.**
Yellow	**Go to GEMINI > SSD'S > FORMAT SSD (1 or 2).**
White	**Card is full; remove the card and transfer the data.**

Are you ready to capture the ultimate quality? The following will walk you through a successful recording.

(1) Assure you have an appropriate power supply.
(2) Make sure any and all necessary settings and metadata have been programmed and saved. See Preparations: Setting Metadata, page 19.
(3) Insert at least one Convergent Design SSD card into either Slot 1 or Slot 2, or insert one in each slot. For more information on 'Handling SSD Cards', visit page 19. The LED SSD Drive Indicator light should be green. If so, proceed to step 4.
(4) If the arrow ">" is next to 'REC' on the Mode Toggle, you are ready to record. If not, tap the Mode once to toggle to 'REC' mode.
(5) Make sure the System Status Indicator is green.
(6) Tap the Record Button to begin your Clip.



(7) Your clip is now recording. Please note:
   a. The System Status Indicator is red.
   b. One of the SSD Status Indicators is Red. If you have two cards in, the other light should be green.
   c. The Status Bar will turn red and your time code should be incrementing.



(8) To stop recording, click the blue Stop Button. The Status Line will indicate that the "Record is Complete".
(9) Record again, or, to watch your clip(s), you are ready for Playback Mode.
(10) Never remove a SSD while recording or playback. See SSD Status page 20.

DPX

Gemini records video into DPX (.dpx) files. DPX is a file format that is specifically designed for uncompressed video. Each DPX file actually only stores one single frame of video. Therefore, each record will have a single folder that contains all of the DPX files. For NLE workflow options, see **TRANSFER**, page 27.

NOTE: A HELPFUL TIP

Clip Number at the end of the Clip Name (AAAAAAA) (OOO) will increment automatically. This can be adjusted by the User under the RECORD | CLIP.

ARI

If recording in ARRIRAW Mode, Gemini produces ARRIRAW (.ari) files. For higher frame rate recordings that require two SSD's: the data files are recorded in alternating fashion onto between SSD's. Before editing, combine the two sets of files into a single folder to obtain the entire clip. ARRIRAW Mode includes .wav audio as well.

NOTE: A HELPFUL TIP

A Frame Counter is displayed at the bottom of the screen during Record, providing a running tally of video frames written to the SSD's.

NOTE: When recording ARRIRAW or LOG…

We suggest you check the monitor out for image quality (proper lighting). When shooting in LOG, the image will look very flat with high contrast. During record, the LCD screen will partially dim to conserve power.

When recording ARRIRAW in Log-C, you must "Apply LUT" on the Gemini LCD to make image Rec709. Also when in ARRIRAW the white balance and shutter speed and ASA can be adjusted and the live image will update accordingly.

RMF

If recording in Canon Raw Mode, Gemini produces Canon Cinema Raw (.ari) files. For higher frame rate recordings that require two SSD's: the data files are recorded in alternating fashion onto between SSD's. Before editing, combine the two sets of files into a single folder to obtain the entire clip. Canon Raw Mode includes .wav audio as well.

WAV

If audio is present on the SDI Input, Gemini records 2 channels of 24 bit audio as a WAV (.wav) file.

PLAYBACK

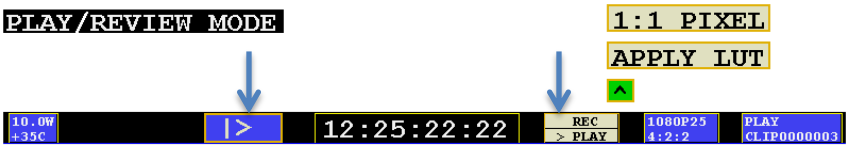
Now that you have successfully recorded to your Gemini 4:4:4, it's time to harness its playback capabilities on its high-definition 800 x 480 monitor.

(1) If the "**>**" is next to '**PLAY**' on the Mode Toggle, you are ready to play back. If not, tap the Mode once to toggle to **PLAY Mode**. The Status Line will indicate that you are now in Play/Review Mode.

WARNING! WARNING! WARNING!

DO NOT REMOVE EITHER SSD CARD DURING PLAYBACK.
THIS MAY RESULT IN DATA THAT IS UNRECOVERABLE.

(2) Tap the blue **Play Button**.
The most recent clip taken will immediately begin playing.



(3) When **Play** has been initiated, the button will change to a **Pause Button**.
(4) When you have completed your review, tap the Mode again to toggle back to **REC Mode.**
(5) For proper playback, all recorded video should be the same video format. Also, assure that any video input present during play is the same format as the recorded material (however, a video input is not required during playback).

WARNING! WARNING! WARNING!

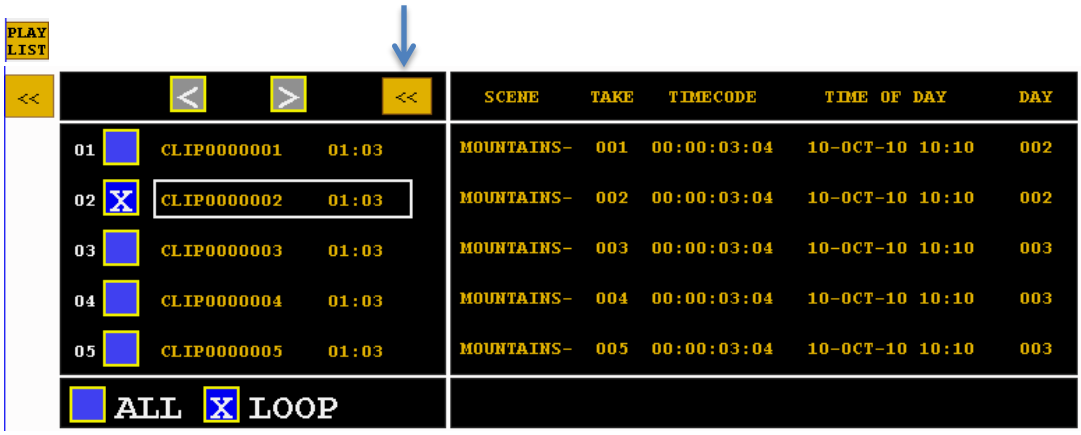
COPYING FILES TO A FORMATTED SSD FOR PLAYBACK ON THE GEMINI 4:4:4 FROM A MAC/PC IS NOT SUPPORTED.

Note: In ARRIRAW Mode, live preview and playback for p48, 50 and 60 will be at 24, 25, and 30 respectively.

PLAYLIST

For additional options in playback, you may choose the 'Playlist' Menu Quick Key to display a list of clips, including metadata and other clip information.

To reveal/hide clip info, simply tab the **<<** button.



All high speed clips will playback at half rate.

(1) Make sure your Toggle is in 'PLAY' Mode.

(2) Click the Playlist Quick Key in the left, upper-third of the monitor. PLAY LIST

(3) Select/deselect by tapping the box next to a clip. **[X]**
   a. You may choose multiple clips.
   b. Use the page arrows, < >, to reveal additional and previous clips (5 clips displayed per page). Selections from previous page will not be lost when using this function.
   c. Choose '**ALL**' to select all available clips.
   d. Choose '**LOOP**' to loop or continuously play selected clips.

(4) Tap the Play Button.
   a. Tap Pause Button to pause.
   b. Toggle to REC Mode when completed to stop.

TRANSFER

Transfer Station

Second Generation Universal Transfer Station

Use only the Convergent Design Universal Transfer Station, in combination with a Seagate GoFlex Adapter (available in Thunderbolt, Firewire, or USB) for transferring data to a computer from a SSD.

Form factor designed to contour the Seagate GoFlex Adapter Series, however, could be used with other 2.5" SATA hard drive docks. Power's provided by AC.

For Thunderbolt adapters, disconnect and reinsert the external cable to the GoFlex each time an SSD is inserted so that the computer will recognize the SSD.

AC-Powered eSATA transfer station is also available.

First Generation Transfer Station (eSATA) - DISCONTINUED

As this is discontinued, you will need to use the Universal Transfer Station (above). If you prefer eSATA transfer, you can request a second generation AC Powered eSATA transfer station. You may request one free; additional may be purchased if required.

Also, do not use any other 3rd party transfer station, as this may compromise the SSD's.

Do not use the USB-powered eSATA transfer station for offloading data. USB power sources do not provide sufficient power which may damage the SSD's.

Convergent Design Universal Transfer Station Instructions

Setup

Connect the Convergent Design Universal Transfer station to any of the following Seagate GoFlex Adaptors: Thunderbolt Adaptor, USB3.0, Firewire 800 Adapter. More on our website.

Transferring Data / Updating a Gemini 4:4:4

Once Connected to a GoFlex adaptor plug in the CD Universal Transfer Station to AC power. For all the Steps below you can leave the CD Universal Transfer Station Plugged into AC power as well as Leave it plugged into you corresponding GoFlex Adapter.

1. Insert a SSD into the CD Transfer Station
2. Connect the Thunderbolt cable, from your Mac to the Goflex Adaptor (Connect the USB 3.0 or Firewire Cable to your Machine).
3. The SSD will mount within 10-20 Seconds (You will see this mount on the desktop or within finder, or on Windows 7 within My Computer).
4. All Clips or Takes are located within the “Clips” directory, navigate to this and copy all of your files to a Local or External Raid, For Playback or Editing (Updating a Gemini 4:4:4 -Copy the update “upd” folder onto the SSD at the main directory level, so that it is next to the “clips” directory).
5. Once you are done Copying Files off, Eject or Safely Remove the SSD.
6. You will see the GoFlex Adaptor flash several times, then become solid, once it has done this, you are safe to remove thunderbolt cable, or the USB / Firewire cable from the GoFlex adaptor
7. Remove the SSD from the CD Transfer Station
8. Insert your Second SSD, and repeat Steps 2 through 7
   NOTE: ALWAYS use the Eject Command (Mac >Finder) and ‘Safely Remove Hardware’ (PC) before pulling SSD’s from transfer station.

Additional Notes

If you encounter an issue when the SSD Is not being detected please remove the cables from the Go Flex adapter, then try reconnecting. If this does not work, reboot the machine and try again.

If a SSD will not mount on a Mac or PC with the instructions provided above, insert the SSD into the Gemini to see if it is being detected. You may need to wait 5-10 Minutes for the SSD to be Reinitialized.

If you encounter any issues following the instructions above, please contact support.

NOTE: Hot swap is not supported with GoFlex Adapter setup, Thus you mush physically unplug and replug the cable or use disk utility and close mount.

Performance

The Gemini 4:4:4 SSD's support read rates of 500 Mbytes/sec. Keep in mind you will be limited by the slowest median in the transfer process. For example: eSATA 3Gbps cards have a max performance of ~270MBps, and eSATA 1.5Gbps have a max performance of ~130MBps.

Typical Hard Drives (Non-RAID) generally perform anywhere in the range of 80-130MBps. For maximum performance, make sure you are using eSATA 6 Gbps, USB 3.0 or Thunderbolt to a Raid configuration.

Suggested Minimum RAID Configuration

Video Format		Video Data Rate Mbytes/Sec	Suggested for Real Time Playback/Edit
ARRI/2K/1080p24 4:4:4 10-Bit DPX		186.6	300
1080p25 4:4:4 10-Bit		194.4	300
1080p30 4:4:4 10-Bit		233.3	400
P50 10-Bit		400	600
P60 10-Bit		500	600

**It's recommended to not exceed 250 clips per card.

FOR BEST PERFORMANCE:

For best performance for playback of DPX or ARRIRAW, we recommend a RAID configuration of 300 MBsp for 1080p30 and 400-500 MBps for 1080p50/60.

File Support

The Gemini 4:4:4 recorder accepts inputs from both HD-SDI 4:2:2 and 4:4:4 cameras.
To record 4:4:4, you can use HD-SDI Dual Link 1.5G or Single Link 3G (up to 1080p30). 1080p50/60 requires Dual 3G.

Note: All ARRIRAW 4:3, and 16:9 p48-60, require Dual 3G SDI.

Note: All Canon Cinema Raw formats, as well as 2K formats, only require a Single 3G SDI.

All DPX, ARRIRAW, and Canon Cinema Raw files are recorded so that each frame of video is a single file, with all frames from a single recording being contained within a single file folder, including a .xml metadata and .wav audio file for each take.

All Files Recorded by the Gemini 4:4:4 are recorded as 4:4:4 10 Bit RGB DPX Files, as this is the industry standard.

Thus, each time you start and stop a recording it will create a new file folder, which takes the name of the Clip, as setup via a menu item in the Gemini 4:4:4:
All clips reside in a **}CLIPS{** folder on the Solid State Drive (SSD).

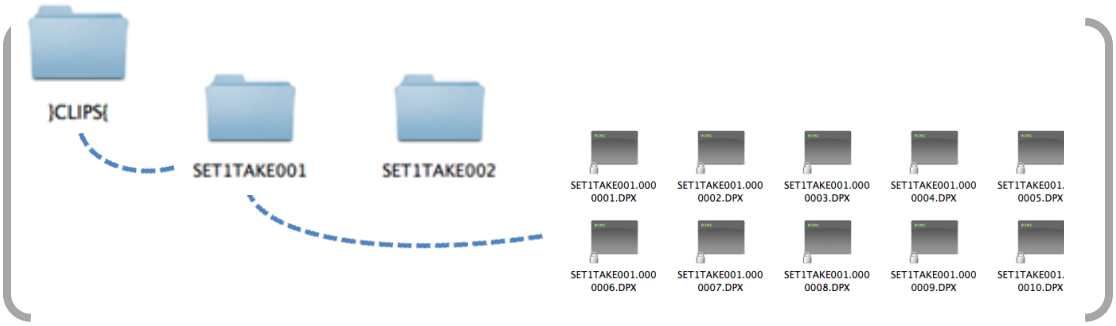
1080p59.94/60 DPX, 3D DPX 1080p29.97/30, 12-Bit DPX (from C500, at all frame rates)

Due to high data rate, DPX file data is stored in a packed format. To un-pack the DPX files (required by most computer software), use our free data transfer/un-packing tool, **Gemini Transfer** from the Downloads page of our website http://convergent-design.com/Downloads/Gemini444.aspx.

DOWNLOAD: Gemini Transfer Utility

Download for Mac Download for PC (requires 32-bit Java Runtime)

File Structure



}CLIPS{

CLIP001001 *(Assuming that the **RECORD|CLIP** is set to (CLIP001) (001))*

CLIP0001001.0000000.DPX

CLIP0001001.0000001.DPX

Etc.

CLIP0001002 *(Assuming that the **RECORD|CLIP** is set to (CLIP001) (002))*

CLIP0001002.0000000.DPX

CLIP0001002.0000001.DPX

Etc.

DPX, ARI, and RMF Frames May contain up to 60,000 Frames per Clip (Based on 512GB Drive)

Transfer Configurations

This is one of many possible transfer configuration. For applying LUTS/LOOKS, and for playback at top performance, a MyBook Studio RAID should be used in a RAID 5 fashion for making a simultaneous backup. You can do the same setup with USB 3.0, Firewire, or Fiber/SCS RAIDS.

Example: Data can be transferred using a Mac Mini or Laptop via Thunderbolt, Firewire 800 or USB 3.0 to an external RAID (Pegasus Promise RAID shown) configured as a RAID 0. This can be used for live playback creating LOOK files or applying LUTs, as well as confidence monitoring of footage. We suggest having a secondary drive (Western Digital MyBook Studio shown, configured as a RAID 5 redundant), which can then make two simultaneous copies of the footage, for deliverables and archive.

Accessing & Using the SSD on A Computer

Versions 1.1.2, 1.2.110, and 1.3.105:

SSD's used with the Gemini will report as entirely full (0 MB free) on a computer, as the Gemini reserves the entire SSD for video only, and prevents the computer from writing to this area. Thus the Gemini video area on the SSD is essentially read-only on a computer).

The SSD's can be used on a computer for playing video directly from the card, for copying video onto the computer's file system, or to copy firmware update files from computer to SSD for updating the Gemini (see the User Manual for more details on updating the Gemini).

Note: Macs require a PCI->Sata Expansion Card to be able to attach a SSD to the Mac via the Transfer Station.

Mac

Insert the SSD (label up) into the provided Transfer Station, and attach the Transfer Station to the Mac via PCI->SATA port and the USB port (which only provides power).

The SSD will appear as a Volume within Finder on the Mac, and can be treated as part of the File System. Like other Volumes on the Mac, the Volume must be dismounted within Finder before being physically removed from the Transfer Station.

PC

For Windows 7 PC's: **Important*: First disable caching of the SSD within Windows, to allow for consistent and correct display of files from 1 SSD insertion/removal to the next.

Disable caching to the SSD

1. Insert the SSD (label up) into the provided Transfer Station, and attach the Transfer Station to the Pc via the SATA port and the USB port (which provides power).
2. Within Windows Explorer, find the Drive Letter associated with the just inserted SSD (256 or 512 GB SSD with ~250 MB available).
3. Right-click the Drive Letter, in the Drop-down Menu choose "Properties".
4. Choose the "Hardware" tab.
5. In the available list, choose the option which begins "C400" - be sure to choose the "C400" option and not a different drive.
6. Click the "Properties" button.
7. Choose the "Change Settings" button.
8. Click the "Policies" tab.
9. **Turn "off" (un-check) the "Enable write-cache option"**, or in some versions of Windows 7, select (check) "Quick Removal" option.
10. Press "Ok" and you're done.

This procedure may need to be repeated if a future insertion of an SSD creates a different Drive Letter within Windows Explorer. If the Drive Letter does not change from one insertion to the next, the procedure does not need to be repeated.

If you are unable to perform the above, For Windows 7, then you may power your computer off, then attach the Transfer Station, SSD, and both cables, then power on your computer. In this case, the computer should recognize your drive.
After copying files to the SSD, you may need to shut down your computer, for the Windows Cache to be cleared (so that the files are actually written to the SSD).

Allow 10-20 seconds for Windows to recognize the SSD, after insertion.

Windows XP:
Avoid having the SSD attached at time of booting a Windows XP machine. Otherwise, if an SSD is attached at time of Windows boot-up, Windows may try to boot from the SSD.

When removing an SSD from the Transfer Station, allow at least 15 seconds before inserting another SSD.

Allow 10-20 seconds for Windows to recognize the SSD, after insertion.

Gemini Clip Merger

The Gemini 4:4:4, in certain modes, records even numbered files (frames of video) to one SSD and odd numbered files to the second SSD. This is done to achieve the very high data rate that some recording modes require.

We have developed a tool to quickly process clips which are recorded using two SSD's. This program renames the files, such that the folder and files (individual frames) would be just as if they were recorded on one SSD.

DOWNLOAD: Gemini Clip Merger

Download for Mac

Download for PC (requires 32-bit Java Runtime)

Basic Instructions for Using Gemini Clip Merger Software

1. Create a folder to hold your footage on our Hard Disk Drive or Raid System, giving it a name meaningful to you, such as "Project Name - Camera A - 2012-09-12",

2. Open the }CLIPS{_____GEMINI__444 folder on your first SSD and copy all of the folders to the folder created in Step 1.
   Do not copy the }CLIPS{_____GEMINI__444 folder itself, copy the contents of the }CLIPS{_____GEMINI__444 folder.

Please refer to the note below if any of the files are 1080p59.94 or 1080p60 DPX files.

3. Open the }CLIPS{_____GEMINI__444 folder on your second SSD and copy all of the folders to the folder created in Step 1. Do not copy the }CLIPS{_____GEMINI__444 folder itself, copy the contents of the }CLIPS{_____GEMINI__444 folder.

   Please refer to the note below if any of the files are 1080p59.94 or 1080p60 DPX files.

4. Run the Gemini Clip Merger Program.

   Note: This program works for both PC and Mac for footage generated from 1.1.100 or higher.
   This program works on the PC for footage generated from 1.2.1 or higher.

   Additional instructions are available in the "Readme" file included in the download.
   Please read the readme file.

Software Applications

If two SSD's are used, then the Gemini Clip Merger should be used as this is the quickest and easiest way to handle the clips.

3D	RAW or HD	Frame Rate	Number of Gemini 4:4:4's Needed	SSD's Needed	Packed	Use Transfer Utility
No	HD	23.976	1	1	No	No
No	HD	23.98	1	1	No	No
No	HD	24	1	1	No	No
No	HD	25	1	1	No	No
No	HD	29.97	1	2	No	No
No	HD	30	1	2	No	No
No	HD	50	1	2	No	No
No	HD	59.94	1	2 512 GB	Yes	Yes
No	HD	60	1	2 512 GB	Yes	Yes
Note: For 1080p59.94 and 1080p60 DPX Recordings, instead of performing a normal "Copy" function in Steps 2 and 3, above, please use the "Gemini Transfer" tool to copy the data from the SSD to the destination folder. **Note: For 12-Bit 1080p50/60, 1080p30 3D, 1080p59.94/60, the DPX files are "Packed". Our Gemini Transfer tool will "Unpack" the files while performing the copy. After using the Gemini Transfer tool, you may then use the "Gemini Clip Merger", as noted in Step 4, above.**						
Yes	HD - 3D	23.976	1	2	No	No
Yes	HD - 3D	23.98	1	2	No	No
Yes	HD - 3D	24	1	2	No	No
Yes	HD - 3D	25	1	2	No	No
Yes	HD - 3D	29.97	1	2 512 GB	Yes	Yes
Yes	HD - 3D	30	1	2 512 GB	Yes	Yes
			1			
3D	**RAW or HD**	**Frame Rate**	**Number of Gemini 4:4:4's Needed**	**SSD's Needed**	**Packed**	**Use Transfer Utility**
No	ARRIRAW 16:9	23.976	1	1	Yes	Yes
No	ARRIRAW 16:9	23.98	1	1	Yes	Yes
No	ARRIRAW 16:9	24	1	1	Yes	Yes
No	ARRIRAW 16:9	25	1	1	Yes	Yes
No	ARRIRAW 16:9	29.97	1	2	Yes	Yes
No	ARRIRAW 16:9	30	1	2	Yes	Yes
No	ARRIRAW 16:9	48	1	2	Yes	Yes
No	ARRIRAW 16:9	50	1	2	Yes	Yes
No	ARRIRAW 16:9	59.94	1	2 512 GB	Yes	Yes
No	ARRIRAW 16:9	60	1	2 512 GB	Yes	Yes
No	ARRIRAW 4:3	23.976	1	2	No	No
No	ARRIRAW 4:3	23.98	1	2	No	No
No	ARRIRAW 4:3	24	1	2	No	No
No	ARRIRAW 4:3	25	1	2	No	No
No	ARRIRAW 4:3	29.97	1	2	No	No
No	ARRIRAW 4:3	30	1	2	No	No
No	ARRIRAW 4:3	48	1	2 512 GB	No	No
3D	**RAW or HD**	**Frame Rate**	**Number of Gemini 4:4:4's Needed**	**SSD's Needed**	**Packed**	**Use Transfer Utility**
Yes	Canon HD 10-Bit Log RGB 444	23.98/24	1	1	No	
Yes	Canon HD 10-Bit Log RGB 444	25	1	1	No	
Yes	Canon HD 10-Bit Log RGB 444	29.97	1	2	Yes	
No	Canon HD 10-Bit Log RGB 444	50	1	2	No	
No	Canon HD 10-Bit Log RGB 444	50.94/60	1	2- 512GB	Yes	

Yes	Canon HD 10-Bit Log YCC 422	23.98/24	1	1	No	
Yes	Canon HD 10-Bit Log YCC 422	25	1	1	No	
Yes	Canon HD 10-Bit Log YCC 422	29.97/30	1	2	Yes	
No	Canon HD 10-Bit Log YCC 422	50	1	2	No	
No	Canon HD 10-Bit Log YCC 422	59.94/60	1	2-512GB	Yes	
No	Canon HD 10-Bit Log YCC 422	100	2	4	Yes	
No	Canon HD 10-Bit Log YCC 422	120	2	4	Yes	
No	Canon HD 12-Bit Log	23.976	1	1	Yes	Yes
No	Canon HD 12-Bit Log	23.98	1	1	Yes	Yes
No	Canon HD 12-Bit Log	24	1	1	Yes	Yes
No	Canon HD 12-Bit Log	25	1	1	Yes	Yes
No	Canon HD 12-Bit Log	29.97	1	2	Yes	Yes
No	Canon HD 12-Bit Log	30	1	2	Yes	Yes
No	Canon 2K 10-Bit RGB	23.98/24	1	1	No	
No	Canon 2K 10-Bit RGB	25	1	1	No	
No	Canon 2K 10-Bit RGB	29.97/30	1	2	Yes	
No	Canon 2K 10-Bit RGB	50	1	2	No	
No	Canon 2K 10-Bit RGB	59.94/60	**Not Supported**			
No	Canon 2K 10-Bit RGB	100	2	4	Yes	
No	Canon 2K 10-Bit RGB	119.88/120	**Not Supported**			
No	Canon 4K Half Raw	50	1	2	No	No
No	Canon 4K Half Raw	60	1	2	No	No
No	Canon 4K Half Raw	100	2	2	No	No
No	Canon 4K Half Raw	120	2	2	No	No
No	Canon 4K Cinema Raw	23.976	1	2	No	No
No	Canon 4K Cinema Raw	23.98	1	2	No	No
No	Canon 4K Cinema Raw	24	1	2	No	No
No	Canon 4K Cinema Raw	25	1	2	No	No
No	Canon 4K Cinema Raw	29.97	1	2	No	No
No	Canon 4K Cinema Raw	30	1	2	No	No
No	Canon 4K Cinema Raw	50	2	4	No	No
No	Canon 4K Cinema Raw	59.94	2	4	No	No
No	Canon 4K Cinema Raw	60	2	4	No	No

Notes - SSD's Needed:

1 = One 256 GB or One 512 GB SSD Needed
2 = Two 256 GB or Two 512 GB SSD's Needed, or one of each
2 512 GB = Two 512 GB SSD's are required for performance reasons, 256 GB SSD's cannot be used
4 = Two 256 GB or Two 512 GB SSD's Needed, or one of each in each of two Gemini 4:4:4's

When only one SSD is required, then the Gemini 4:4:4 will automatically span from one SSD to the next.
Please note that the removal (or "Hot Swapping") of an SSD while the unit is recording or playing back is not supported.

Notes - Packed and Use Transfer Utility:

If Packed is "Yes", then the DPX file is recorded in a special, space efficient method.
The free Convergent Design Transfer Utility must be used to unpack the data into normal DPX format.

Notes - Gemini Clip Merge Utility:

Our Gemini Clip Merger Utility can be used to combine Striped/Raided Records into Single Clips after the _SSD1/_SSD2 folders have been copied over to a common folder on a computer.

POST WORKFLOW

DPX Files (10-Bit)

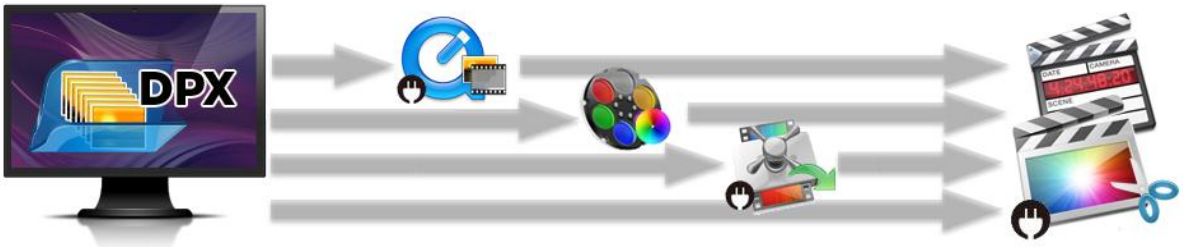
All DPX files are 10-bit RGB 4:4:4. See page 13 for more information related to 1080p59.94/60 in Rec709 and LOG.

Adobe

Software	Imp/Exp	File Type	Function and General Notes
After Effects CS4 CS5 CS5.5 CS6	Import	Native Support for DPX	• Check Playback • Apply Color Correction • Apply LUT • Can be sent directly to Adobe Premier / Media Encoder • Create Proxy **For help importing /exporting and general workflow questions, please visit the AE forum, DVinfo forum, and DVXuser forum.**
	Export	• After Effects Project • Premier Pro Sequence • Uncompressed QuickTime Movie	
Media Encoder CS5 CS5.5 CS6	Import	• After Effects Project • Premier Pro Sequence	• Encode *This will be dependent of any Codec installed on your machine
	Export	• Uncompressed QuickTime Movie • *Codec of Choice DNxHD, XDCAM, ProRes	
Photoshop CS4 CS5 CS5.5 CS6	Import	Native Support for DPX	• Viewer (individual frames) • Used to check a Single Frame • Check Playback • Apply LUT • Create Proxy
	Export	• DPX • JPG, etc.	
Premier Pro CS4 CS5 CS5.5 CS6	Import	• Native Support for DPX • Wav Audio Support • After Effects Project • Premier Pro Sequence • Uncompressed QuickTime Movie	• Viewer (individual frames) • Used to check a Single Frame • Check Playback • Apply LUT • Create Proxy • Be sure to select “Numbered Stills” Option…. • For optimal playback, import as After Effects Project or import as Premier Pro Project directly from After Effects.
	Export	Final Production	(Deliverable File)
Bridge CS4 CS5 CS5.5 CS6	Imp/Exp	• Native Support for DPX • Wav Audio Support	• Batch Renaming • Check Metadata & Preview Individual Frames
Sound Booth	Imp/Exp	Wav Audio Support	• Edit Audio

CS4 CS5			
Audition CS5.5 CS6	Imp/Exp	Wav Audio Support	• Edit Audio
SpeedGrade CS6	Imp/Exp	• Native Support for DPX • Export to After Effects / Premier / Media Encoder	• Check Real-time Playback • Apply LUT • Apply Color Correction • Create Proxy • Great for DIT in the field
Prelude CS6	Imp/Exp	• Native Support for DPX • Export to After Effects / Premier / Media Encoder	• Data Management • Concatenate Files • DIT / Visual Field Checks • Generate Looks/LUTs • Create Batches • Batch Renaming • Straight to Encode (Media Encoder)

Apple



Color 1.5.3 (FCP7)	Import	Native Support for DPX		• Check Playback/real time playback • Apply Color Correction • Apply LUT • Create Proxy
	Export	Final Cut Pro Project / Sequence		Export to Final Cut Pro
Compressor 3.5 (FCP 7) 4 (FCP X)	Import	DPX Plug In	• Glue Tools (Mac) • Cineform Remaster	• Encode • Check playback • Quicktime • ProRes DNxHD
	Export	*Codec of Choice: DNxHD, XDCAM, ProRes		*With Glue Tools you can import DPX files, then Encode to Codec of choice
Final Cut Pro 6 7 X	Import	DPX Plug In	• Glue Tools (Mac) • Cineform Remaster	• Apply LUT • Check Playback • Edit *Plug In allows you to import DPX files directly.
		Audio	• Wav Audio Support	
	Export	Final Production (deliverable file)		
Soundtrack Pro	Imp/Exp	Wav Audio Support		• Edit Audio

Quicktime Pro	Imp/Exp	DPX Plug In	Native DPX import DPX w/ Glue Tools	• Export • Encode to Codec of choice

AutoDesk

Smoke Flame Lustre	Import	• Native Support for DPX	• Create Proxy • Check Real Time Playback • Apply Color Correction • Apply LUT • Edit
	Export	• NLE • Uncompressed QuickTime Movie • Final Production	

Avid

Avid DS 10.5	Import	• Native Support for DPX • Wav Audio Supported		• Create Proxy • Check Playback • Edit
	Export	Final Production		Export to Final Cut Pro
MetaFuze	Import	Native Support for DPX		• Encode • Create Proxy
	Export	*Codec of Choice: DNxHD, XDCAM, ProRes		
Media Composer 5.5 6	Import	DPX Plug In	• Metafuse • Cineform Studio • Cineform Professional	• Check Playback • Edit *Plug In allows you to import DPX files directly
		Audio	• Wav Audio Support	
	Export	Final Production (deliverable file)		
Pro Tools	Imp/Exp	Wav Audio Support		• Edit Audio
Symphony	Import	DPX Plug In	• Metafuse • Cineform Studio • Cineform Professional	• Check Playback • Edit • Color Correct *Plug In allows you to import DPX files directly
		Audio	• Wav Audio Support	
	Export	Final Production (deliverable file)		

Assimilate

Scratch/ Scratch Lab	Import	Native Support for DPX	• Create Proxy • Check Real Time Playback • Apply Color Correction • Apply LUT Edit
	Export	• NLE • Final Production	

CineForm / GoPro

Neo Scene Studio Premium Studio Professional Remaster	Import	Native Support for DPX	• Ideal for working with Avid • Encode • Create Proxy *Once files are converted to CineForm 444, you can import them
	Export	• CineForm 444 • ProRes 444 • (other installed Codecs)	

ColorFront

OnSet Dailies	Import	Native Support for DPX	• Check playback • Edit • Apply LUT • Color Correction • Create Proxy
	Export	• NLE • Final Production	

Eyeon

Fusion 6	Import	Native Support for DPX	• Check playback • Edit • Apply LUT • Color Correction • Create Proxy
	Export	• NLE • Final Production	

Maxon

Cinema 4D	Import	Native Support for DPX	• Check Playback • Edit
	Export	• NLE • Final Production	

NewTek

LightWave 3D 10.1	Import	Native Support for DPX	• Check Playback • Apply Color Correction • Apply LUT • Edit
	Export	NLE / Final Production	

The Foundry

Nuke 6.3 Furnace 4.2 FurnaceCore 4.3	Import	Native Support for DPX	• Check Playback • Apply Color Correction • Apply LUT • Edit • Create Proxy
	Export	NLE / Final Production	

Sony

Vegas 12	Import	• Planned Support of Gemini DPX files (near future) • Wav Audio Supported	• Check Playback • Apply Color Correction • Apply LUT • Edit • Create Proxy
	Export	Final Production	

Grass Valley

Edius 5 6	Import	• Native Support for DPX • Wav Audio Support	• Create a new bin • Import File • Select 'File As Sequence' • Check Playback • Apply Color Correction • Apply LUT • Edit • Create Proxy
	Export	Final Production	

Black Magic

DaVinci Resolve Resolve Lite	Import	Native Support	• Create Proxy • Check Playback • Apply Color Correction • Apply LUT • Edit
	Export	NLE / Final Production	
Media Express	Import	Native Support	• Check Playback • Encode *If you have DeckLink 3D, or 4:4:4 card, it will playback and exp
	Export	Uncompressed Quicktime Movie	

AJA

DPX Translator	Import	Native Support	• Check Playback • Encode
	Export	Uncompressed Quicktime Movie	

DPX Viewers

DJViewer	Import	Native Support	• Check Playback • Color Correct
	Export	Jpeg, DPX, etc.	
XNView	Import	Native Support	• Check metadata • Preview individual files • Batch renaming
	Export	Jpeg, DPX, etc.	
POM DPX Header Editor	Import	Native Support	• Renaming files • Changing metadata fields
	Export	Renamed Files	

Convergent Design

Gemini Transfer	Import	DPX (p59.94/ 60)	
	Export	Unpacked 4:2:2 1080p59.94/60	
Gemini Clip Merger	Import	1080p29-60p clips	This software merges clips (SSD1 & SSD2) for all Raided formats. See table page 37-38.
	Export	Combine Files/Takes	

DPX 1080p59.94/60 when recorded in Gemini are packed, thus the files may not look correct until unpacked, using this free transfer tool.

ARRIRAW Files

ARRIRAW files are 12-bit Logarithmic uncompressed, thus you can adjust the look, ASA, white balance, shutter speed, and log in Post. This allows for the most image flexibility. Depending on your workflow, ARRIRAW files are often exported ASA 4:4:4 RGB DPX or Tiff files (see the DPX Section above for compatible NLE's.). The following are NLE's supporting ARRIRAW workflow.

ARRI

ARRIRAW Converter	Import	• Import ARRIRAW (16:9 / 4:3)	• ARRIRAW Preview/Playback • Convert to universal format, DPX
	Export	• Export DPX / TIFF	
ARRI LOOK Creator	Import	• ARRIRAW Frame	• User defined looks for custom rendering
	Export	• Rec709 DPX / TIFF / Custom Look File	
ARRI LUT Generator	Import	• ARRIRAW Frame	• User defined looks for custom rendering
	Export	• Rec709 DPX / TIFF / Custom Look & LUTs	

ADOBE

After Effects CS6	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check Playback • Apply Color Correction • Apply LUT • Can be sent directly to Adobe Premier / Media Encoder • Create Proxy **For help importing /exporting and general workflow questions, please visit the AE forum, DVinfo forum, and DVXuser forum.**
	Export	• After Effects Project • Premier Pro Sequence • Uncompressed QuickTime Movie • Final Production	
Media Encoder CS6	Import	• After Effects Project • Premier Pro Sequence	• Encode to Codec of choice *This will be dependent of any Codec installed on your machine
	Export	• Uncompressed QuickTime Movie • *Codec of Choice DNxHD, XDCAM, ProRes	
Photoshop CS6	Import	Native Support for DPX / TIFF	• Viewer (individual frames) • Used to check a Single Frame • Check Playback • Apply LUT • Create Proxy
	Export	• TIFF • DPX • JPG, etc.	
Premier Pro CS6	Import	• Native Support for ARRIRAW (16:9 / 4:3) • Wav Audio Support • After Effects Project • Premier Pro Sequence • Uncompressed QuickTime Movie	• Viewer (individual frames) • Used to check a Single Frame • Check Playback • Apply LUT • Create Proxy • Be sure to select "Numbered Stills" Option…. • For optimal playback, import as After Effects Project or import as Premier Pro Project directly from After Effects.
	Export	Final Production	(Deliverable File)
Bridge	Imp/Exp	• Native Support for DPX / Tiff • Wav Audio Support	• Batch Renaming • Check Metadata & Preview Individual Frames
Audition	Imp/Exp	Wav Audio Support	• Edit Audio

SpeedGrade CS6	Imp/Exp	• Native Support for ARRIRAW (16:9 / 4:3) • Export to After Effects / Premier / Media Encoder	• Check Real-time Playback • Apply LUT • Apply Color Correction • Create Proxy • Great for DIT in the field
Prelude CS6	Imp/Exp	• Native Support for ARRIRAW (16:9 / 4:3) • Export to After Effects / Premier / Media Encoder	• Data Management • DIT / Visual Field Checks • Generate Looks/LUTs • Create Batches • Batch Renaming • Straight to Encode (Media Encoder)

ARRITOOLS

ARRI Camera Toolkit	Import	Native Support for ARRIRAW (16:9 / 4:3)		• Create Proxy • Check Playback • Apply Color Correction • Apply LUT Edit
	Export	DPX Plug In	• FCP 7 • FCP X • QT Pro • NLE • Final Production	

ASSIMILATE

Scratch/ Scratch Lab	Import	Native Support for ARRIRAW	• Check Real-time Playback • Apply LUT • Apply Color Correction • Create Proxy • Great for DIT in the field
	Export	• NLE • Final Production	

BLACK MAGIC

DaVinci Resolve Resolve Lite	Import	Native Support	• Create Proxy • Check Playback • Apply Color Correction • Apply LUT • Edit
	Export	NLE / Final Production	
	Export	Uncompressed Quicktime Movie	

COLORFRONT

OnSet Dailies	Import	Native Support for ARRIRAW(16 :9 / 4:3)	• Check playback • Edit • Apply LUT • Color Correction • Create Proxy
	Export	• NLE • Final Production	

DIGITAL FILM TECHNOLOGY

Flexity	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

DVS

Clipster	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

FILMLIGHT

Baselight	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

IMAGE SYSTEMS

Nuendoa Filmaster	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

MTI FILM

Control Dailies	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

PANDERA

Revolution	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

QUANTEL

Pablo	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

SGO

Mistika	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

TWEAK

RV	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

NUKE

Nuke	Import	Native Support for ARRIRAW (16:9 / 4:3)	• Check playback • Edit • Apply Look / LUTs • Color Correction
	Export	• NLE • Final Production	

CONVERGENT DESIGN

Gemini Clip Merger	Import	ARRIRAW 48-60p clips	This software merges clips (SSD1 & SSD2) for all Raided formats. See table page 37-38.
	Export	Combined Clips/Takes	

Canon

Cinema Raw Files

The Gemini 4:4:4 is cable of recording Canon RAW files, which must be processed with Canon's Raw Utility, (This will allow you to debayhor, change the white balance, and ASA of your files, then Export the files as a 10 Bit or 16 Bit DPX.) The Exported dpx files then be used with the following editors / Color Correctors.

The Gemini 4:4:4 is capable of recording 12 Bit 4:4:4 files, and 12 Bit 4:2:2 files, from the Canon C500, which we need to be used with the Gemini Transfer program, to "unpack" the files to 16 Bit. Once the files are "unpacked" they can be used with the following editor's / Color Correctors.

Cinema Raw files are 10 or 12-Bit, and are exported as .rmf files. The following are NLE's supporting Canon C500 workflow.

- Canon Raw Development
- Resolve version 9.0.4
- Assimilate
- YoYo
- Colorfront

DPX Files (16-Bit 4:4:4)

Adobe

Software	Imp/Exp	File Type	Function and General Notes
Photoshop	Import	Native Support for DPX	• Viewer (individual frames)

CS4 CS5 CS5.5 CS6	Export	• DPX • JPG, etc.	• Used to check a Single Frame • Check Playback • Apply LUT • Create Proxy
	Export	Final Production	(Deliverable File)
Bridge CS4 CS5 CS5.5 CS6	Imp/Exp	• Native Support for DPX • Wav Audio Support	• Batch Renaming • Check Metadata & Preview Individual Frames
Audition CS5.5 CS6	Imp/Exp	Wav Audio Support	• Edit Audio
SpeedGrade CS6	Imp/Exp	• Native Support for DPX • Export to After Effects / Premier / Media Encoder	• Check Real-time Playback • Apply LUT • Apply Color Correction • Create Proxy • Great for DIT in the field
Prelude CS6	Imp/Exp	• Native Support for DPX • Export to After Effects / Premier / Media Encoder	• Data Management • Concatenate Files • DIT / Visual Field Checks • Generate Looks/LUTs • Create Batches • Batch Renaming • Straight to Encode (Media Encoder)

Apple

Color 1.5.3 (FCP7)	Import	Native Support for DPX		• Check Playback/real time playback • Apply Color Correction • Apply LUT • Create Proxy
	Export	Final Cut Pro Project / Sequence		Export to Final Cut Pro
Compressor 3.5 (FCP 7) 4 (FCP X)	Import	DPX Plug In	• Glue Tools (Mac) • Cineform Remaster	• Encode • Check playback • Quicktime • ProRes DNxHD
	Export	*Codec of Choice: DNxHD, XDCAM, ProRes		*With Glue Tools you can import DPX files, then Encode to Codec of choice
Final Cut Pro 7 X	Import	DPX Plug In	• Glue Tools (Mac) • Cineform Remaster	• Apply LUT • Check Playback • Edit *Plug In allows you to import DPX files directly.
		Audio	• Wav Audio Support	
	Export	Final Production (deliverable file)		
Soundtrack Pro	Imp/Exp	Wav Audio Support		• Edit Audio

Quicktime Pro	Imp/Exp	DPX Plug In	Native DPX import DPX w/ Glue Tools	• Export • Encode to Codec of choice

AutoDesk

Smoke Flame Lustre	Import	• Native Support for DPX	• Create Proxy • Check Real Time Playback • Apply Color Correction • Apply LUT • Edit
	Export	• NLE • Uncompressed QuickTime Movie • Final Production	

Avid

Avid DS 10.5	Import	•Native Support for DPX •Wav Audio Supported	• Create Proxy • Check Playback • Edit
	Export	Final Production	Export to Final Cut Pro
MetaFuze	Import	Native Support for DPX	• Encode • Create Proxy
	Export	*Codec of Choice: DNxHD, XDCAM, ProRes	
Media Composer 5.5 6	Import	DPX Plug In: • Metafuse • Cineform Studio • Cineform Professional	•Check Playback •Edit *Plug In allows you to import DPX files directly
		Audio: • Wav Audio Support	
	Export	Final Production (deliverable file)	

The Foundry

Nuke 6.3 Furnace 4.2 FurnaceCore 4.3	Import	Native Support for DPX	• Check Playback • Apply Color Correction • Apply LUT • Edit • Create Proxy
	Export	NLE / Final Production	

ColorFront

OnSet Dailies	Import	Native Support for DPX	• Check playback
	Export	• NLE • Final Production	

Eyeon

Fusion 6	Import	Native Support for DPX	• Check playback • Edit • Apply LUT • Color Correction • Create Proxy
	Export	• NLE • Final Production	

Maxon

Cinema 4D	Import	Native Support for DPX	• Check Playback • Edit
	Export	• NLE • Final Production	

NewTek

LightWave 3D 10.1	Import	Native Support for DPX	• Check Playback • Apply Color Correction • Apply LUT • Edit
	Export	NLE / Final Production	
	Export	Final Production	

Grass Valley

Edius 5 6	Import	• Native Support for DPX • Wav Audio Support	• Create a new bin • Import File • Select 'File As Sequence' • Check Playback • Apply Color Correction • Apply LUT • Edit • Create Proxy
	Export	Final Production	

Black Magic

DaVinci Resolve Resolve Lite	Import	Native Support	• Create Proxy • Check Playback • Apply Color Correction • Apply LUT • Edit
	Export	NLE / Final Production	

Convergent Design

Gemini Transfer	Import	DPX (p59.94/ 60)	
	Export	Unpacked 4:2:2 1080p59.94/60	
Gemini Clip Merger	Import	1080p29-60p clips	This software merges clips (SSD1 & SSD2) for all Raided formats. See table page 37-38.
	Export	Combine Files/Takes	

DPX 1080p59.94/60 when recorded in Gemini are packed, thus the files may not look correct until unpacked, using this free transfer tool.

XML Files / Metadata

The Gemini 4:4:4 records meta data information for every file/frame. Inside each clip directory there is a XML Metadata file, which can also be used when importing metadata in a NLE / Color Corrector. (This applies for DPX, ARRIRAW, and Canon 4K Cinema Raw).

APPENDIX

Firmware Updates

NOTE: Firmware Updates

We strongly recommend you always keep your Gemini 4:4:4 updated with the latest firmware. We frequently add new features and bug fixes at no cost. Check Here!

Firmware Update Instructions

We recommend that you print out these instructions, if possible (pages 37-40).

1. Your computer must have an internet connection so you may access our website.

2. Navigate to our website: Firmware Updates > Gemini 4:4:4

3. On the Right Side of the page, you will find “Current Firmware”.
   Make a note of the firmware version that you will be downloading.

4. Format a SSD in the Gemini 4:4:4 (ensuring that no important clips are on the SSD first).

5. Insert the formatted SSD card in the transfer station.

6. Connect the transfer station to your computer.
   For Universal Transfer Station: Connect with Seagate GoFlex Adapter appropriate cabling.

a. We recommend creating a folder named something like the following:
   Gemini 444 Firmware 2012-05-24 (1.1.2). This example uses today’s date and firmware number as listed in our webpage, but you may create a folder using a folder name of your choice.

7. Click on the firmware version that you wish to download.
   Note: You may reinstall an earlier version of the firmware, if desired.

For Windows 7: (Other Windows Computers will be similar)
See below for Mac instructions

8. Click on Save As.

9. Navigate to the folder you just created.

10. Click on Save. The file you saved will be Gemini 1.1.2.zip
(or the current firmware version number)

11. Navigate to this folder and file. (You may just click on “Open Folder”)

12. Double Click on this file. It will be something like “Gemini 1.0.105.zip” but with the current firmware number.

13. Click on Extract All Files.

14. Click on Extract.

15. Double Click on Gemini 1.0.105 (or current firmware version number).

16. Drag and Drop the }GEM_UPDATE{ folder to your SSD Drive
(Listed under Computer) on the left hand side of your screen.

    Note: The SSD may be “No Name”, and it can be any Drive Letter”, but it will have a }CLIPS{ folder on the drive.

    Do not copy the firmware update into the }CLIPS{ folder.

    Answer Yes to: “Do you want to copy this folder without Encryption?”

    And Answer Yes to: “Do you want to copy this file without Encryption?”

    Skip over “For Mac” instructions to finish the update.

For Mac

8. Start with Steps 1 through 7 above.

9. Double click on the }GEM_UPDATE{.zip

10. Copy or Drag }GEM_UPDATE{ folder to SSD.

For Both Mac and Windows (PC continued)

1. If done successfully, you will have:

}CLIPS{	**(An Empty Folder)**
}GEM_UPDATE{	**(The Update Folder)**
}GEMINI{.UPD	**(The Actual Firmware Update File)**

2. Use the “Safely Remove Hardware” option or shutdown/restart your computer gracefully, to ensure that the firmware has been completely transferred to the SSD.

3. Otherwise, the firmware update may not be successfully copied to the SSD, and then the Gemini 4:4:4 will not find the firmware update.

11. Ensure that you have adequate power to power the Gemini 4:4:4, either battery or AC Power. The firmware update takes approximately 5 minutes, but please ensure that you have at least 30 minutes of battery time remaining to ensure safety.

12. Power up the Gemini 4:4:4.

13. Removing any video input cables.

14. Remove all SSD’s.

15. Insert the SSD with the firmware update.

16. Then power on the unit.

17. You will see a Firmware Update screen if the file is on the SSD properly.

18. Follow the On-Screen Prompts to complete the firmware update.

19. When complete it will say: “DONE – PLEASE REMOVE UPDATE DRIVE”
(Please remove the SSD; The unit will then power off and back on automatically).

20. If you wish to then reuse this SSD (normally the case, unless you have additional Gemini 4:4:4's to update):
    a. Insert the SSD back into the Gemini 4:4:4
    b. Click on Cancel (to avoid performing the Firmware Update again)
    c. Reformat the SSD (Click on Menu, then Gemini, then SSD's, then Format SSD1 or Format SSD2)

    This step is very important:

    Then power off the Gemini 4:4:4, then Power it back on.
    If you fail to perform this step to power cycle the unit, then all features of the Gemini 4:4:4 may not work properly.

TROUBLE SHOOTING: ! UPDATE FAILED ! or ! EMERGENCY UPDATE !

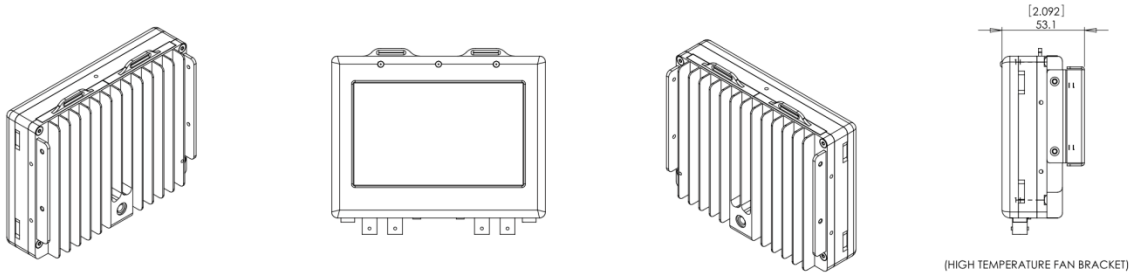
Check your power source, pull the power, and then run the update again. MAKE SURE THERE IS NO VIDEO SOURCE plugged into the unit, and that there is only ONE SSD PRESENT. If this process fails twice, contact Support.

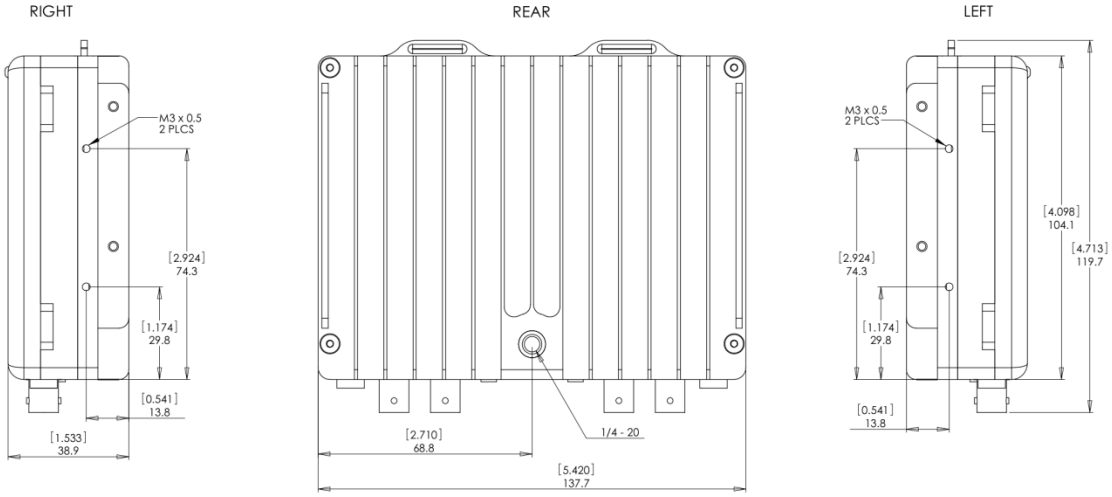
Specifications

Feature	Specification
Video I/O Ports	Four SDI ports: 2-In (HD-SDI Single Link/Dual Link/3G), 2-Out (HD-SDI Single Link/Dual Link), HDMI-Out
Video Standards	HD-SDI, SMPTE 292M; HD-SDI 3G, SMPTE 424M; HD-SDI Dual-Link, SMPTE 372M
Video Formats	
REC 709	RGB 444 / YCC 422 1080p up to 30fps, YCC 422 1080p up to 60fps
ARRIRAW**	ARRI Alexa: 16:9 (2880x1620) up to 60fps; 4:3 (2880x2160) up to 48fps
Stereo 3D	3D DPX: RGB 444 / YCC 422 1080p up to 30fps (Dual Gen-locked inputs, recorded individually, with Combining options for display
Canon 4K Cinema Raw	23.98/24/25/29.97/50/59.94 4K and Quad HD
Canon 4K Half Raw	50/59.94/100/119.9fps
Canon 2K 10-Bit	RGB 444: 23/24/25/29
Canon 1080p 12-Bit	RGB 444: 23.98/24/25/29.97fps
Canon 1080p 10-Bit	RGB 444: 23.98/24/25/29.97/50/59.94fps
	YCC 422: 23/24/25/29/50/59/200/119
Record Options	
Compressed	Avid DNxHD support (QT) for 1080p YCC 422 up to 30fps (4th Qtr 2012 Release)
Uncompressed	1080p 10-Bit RGB 444 up to 60fps (DPX) with TC and metadata, audio recorded as wav file
RAW Formats	ARRIRAW, Canon Cinema Raw
Multi-Stream (x2)	Parallel recording of two RGB 444 Streams up to 1080p30 (with 3D Option)
Live Preview / Playback	
Single Stream	Real time decompressed / debayered output with / without LUT applied
Stereo 3D*	Individual output of each stream or combined streams: Side by Side, Line by Line, Anaglyph, 50/50 Composite
Log Viewing LUTs	Support for S-Log, Log-C with user programmable 1D LUTs
Playback Control	Play, Rewind, Fast-Forward, Pause, and Step Control
Metadata	Reel Number, Scene Number, Take Number and Project Name
Media	Two Slots for 1.8" Solid State Drives (SSD), 256GB / 512GB sizes
Transfer Station	1.8" SSD Transfer Station compatible with Seagate GoFlex Adapters (USB 3, FW-800, Thunderbolt) or eSATA AC-Powered Transfer Station (one included)
Built-In LCD Monitor	5" high brightness LCD, sunlight viewable, 800 cd/m², 800 x (RGB) x 480 Pixels, 24-Bit, 900:1 True Contrast, Wide +/-85° Viewing Angle (IPS Technology)
	1:1 Pixel Option, with user positioning of desired window via touch control
Menu System	Touch Sensitive menu system with user-defined presets and customizable level of on-screen data
Timecode	HD-SDI Embedded (SMPTE RP-188) or LTC via the remote control option
Digital Audio I/O	HD-SDI Embedded 4-Channels, uncompressed, 24-Bit, 48K
Analog Audio I/O	3.5 mm output jack, headphone or consumer line level
Power Requirements	6 to 19 Volts DC, 6 to 15 watts
Size, Weight	138 x 120 x 37 mm (5.4 x 4.7 x 1.45"); 612 grams (1.35 lb); Milled Aluminum Case
Environmental	Ambient Temp: -10 to +40 °C (Operating) / -20 to +70 °C (Storage)
Gemini Production Kit	Gemini 444 Recorder + SSD Transfer Station + HD-SDI cables + HDMI Cable + Hotshoe with 1/4"x20 Ball Mount + Universal AC Power Supply + 4-Pin XLR Power Cable + D-Tap Power Cable; all packaged in a Custom Fitted Hard Plastic Case
Optional Accessories	256GB / 512GB SSD Media, Sun-Screen, Remote Control (with pushbutton start/stop, tally light and LTC I/O)
Notes	**ARRIRAW, Canon Raw, and Stereo 3D are extra cost options
	All Specifications subject to change without notice.

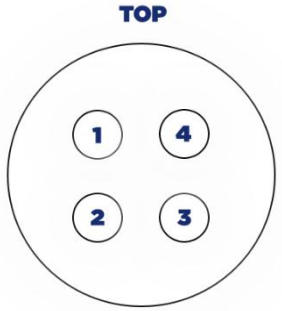
Gemini Mechanical Drawings

Useful for your mounting needs and designs, please find below mechanical drawings of the Gemini 4:4:4.



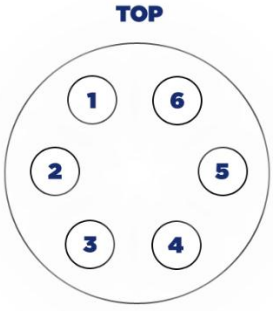


Remote Connector Pinout



POWER PINOUT

(1) Power: +6.5 ~ +19V,
(2) Power: +6.5 ~ +19V
(3) Ground
(4) Ground



REMOTE PINOUT

(1) 232 - RX
(2) Remote
(3) LTC-I/O
(4) GPI
(5) GND
(6) 232 - TX

Best Practices for Handling SSD Media, BNC Cables and Power

In order to avoid catastrophic data loss, and reap the best use of your Convergent Design SSD cards, it is imperative you read this document thoroughly.

DOWNLOAD: Service Bulletin, Best Practices

Handling SSD's, BNC Cables & Power

Background

The 256 and 512GB 1.8" SSDs (Solid-State Drives) utilized with the Gemini 444 recorder offer a tremendous amount of reliable storage in a very small form factor. They are marvels of advanced semiconductor processing, packing upwards of 600 Billion transistors in a package that fits in the palm of your hand. These high density SSDs offer amazing data-rates, up to 500MB/sec read and 260MB/sec write speeds, enabling recording of uncompressed HD and raw video up to 4K resolution.

But high data-rates require associated high-power, as the I/O throughput is achieved by reading / writing to eight (or more) individual ICs (integrated circuits) in parallel. The highest power requirement occurs during a write operation, where power consumption of 5 watts per 512GB SSD is not uncommon. Power consumption is directly dependent on the write speed, the greater the power. Additionally, high frame-rate (48/50/60 fps) video requires writing video to two SSD drives in parallel, which can raise the overall SSD power to close to 10 Watts. Add the power requirements for the LCD and other control circuit and total Gemini power can reach 16 watts.

SSD drives are very sensitive to power glitches, especially during write operations. A significant drop in the voltage can cause an errant write in the SSD, which can corrupt a frame of video, scramble the file directory/FAT or worse case cause an unrecoverable drive failure. Power management is therefore crucial for reliable operation. Particularly challenging is managing the power spike which occurs during the transition from idle mode to record as well as closing the files at the conclusion of a record session. Power can instantly jump from 6 to 16 watts when the record button is pressed. So a power system that seemed adequate in idle mode (live view) may instantly cause the Gemini to reboot and wipe out one or more SSDs during the transition to record mode. Inadequate power can also cause failures during file closing at the end of a record session, which causes a second spike (due to updating FAT tables, etc).

Additionally, insufficient SSD power can also lead to failures during the offload of video data from the SSD to a computer or loading new Gemini firmware updates onto the SSD. Anytime an SSD is connected to a PC/MAC, the operating system may perform file indexing operations, which can result in write operations to the SSD. Even in idle mode, SSDs perform housekeeping operations

(such as wear leveling and garbage collection) which result in write operations. That's why it's also best to perform an "eject" before removing any flash based memory (including USB drives and SSDs).

Best Practices

With this background in SSD power requirements, we offer the following best practices in handling SSDs:

SSDs in Gemini 4:4:4

- Ensure the power supply (battery, AC or power tap off the camera) can supply at least 20 watts to the Gemini (to support both average and instantaneous power). In particular do not use "Y" cables off the +12V power tap on the ALEXA. Do no attempt to power multiple devices (Gemini + LCD monitor) from this power source.
- Do not run your batteries down to zero charge, stop at 15% remaining capacity to enable adequate power to record and close files.
- If you do lose power while recording, remove the SSD's and use other SSD's for further recording. If you repower the camera and Gemini 4:4:4, then record on the same SSD's, the footage recorded after the power failure will be inaccessible.
- NEVER remove an SSD while recording or playing video. This can cause catastrophic failure of the drive and resultant lost footage.
- If you accidentally cause a drive failure, you may be able to recover the drive by removing the video cables to the Gemini 4:4:4, removing other SSD's, then inserting the SSD in a (powered) Gemini and waiting upwards of 20 minutes for the drive to rebuild itself.
- After 20 minutes, power off the Gemini 4:4:4, wait 5 seconds, then power it on again. If the recovery was successful, then the SSD LED will turn green after about 10 seconds or so. We may also be able to recover the files. Please contact tech support for more details.
- If an SSD does recover, please sequester this drive and do not record any additional video to this drive. We may be able to recover the last "take" if no additional recording is added to the card. Again, please contact tech support for additional guidance.
- When prompted, please perform SSD Update to version xxx (takes 30 seconds). This greatly impacts reliability and performance of the SSDS.

Transferring SSD Video Using PC/MAC, Updating Firmware

- Due to the marginal power output of most USB power supplies, we recommend switching from the original eSATA transfer station to the new Universal Transfer Station as soon as possible. The Universal Transfer station has a built-in (AC) power source, with more than adequate power to ensure safe transfers of SSD data <-> PC/MAC. This new transfer station is compatible with the following adapters from the hard-drive manufacturer, Seagate. The transfer method is listed in preferred order:

NOT INCLUDED, PLEASE PURCHASE SEPARATELY

Thunderbolt:
Seagate GoFlex Model STAE121 We have measured 325-375MB/sec transfer rates to a fast RAID drive, depending on your configuration.

USB 2.0 / 3.0:
Seagate GoFlex Model STAE104 or Calvary USB 3.0 Adapter, Model CAUSM2001. An ExpressCard 34 to USB 3.0 adapter may be required for full USB 3.0 compatibility. However, USB 2.0 works fine to copy Gemini firmware updates to the SSD.

Firewire 800:
Seagate GoFlex Model STAE102 This is the slowest interconnect (other than USB 2.0), but it's a safe method to copy files.

If you do not have one of the new FREE universal transfer stations, please contact your local dealer or visit our Website.

- If eSATA is the only viable option for SSD data transfer, we recommend using an external AC powered USB supply rated at 10 Watts. An excellent choice is the iPad power supply, which provides USB power. Do not use the USB power from your PC/MAC to power the eSATA transfer station.
- We do NOT recommend eSATA adapters for Mac's running OSX Lion/Mountain Lion.

BNC Cables

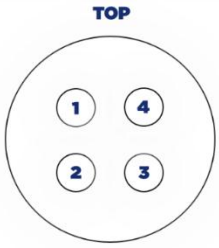
Poor quality BNC cables can result in lost and/or corrupted video and otherwise unreliable operation. This problem has become more widespread with the use of 3G (3 GHz) video throughout the industry. We therefore offer the following recommendations:

- Always, always use 3G rated SDI cables. It's too easy to switch from 1.5G dual link to 3G single link and forget to switch to a better grade SDI cables. Toss out all those older 1.5G cables and avoid all the headaches (note the supplied cables with the Gemini work great at 3G). Extra HD-SDI 3G Rated Cables, identical to the ones included with the Gemini 4:4:4, may be ordered from your local dealer. It is a great idea to have spares on hand.
- Never add a "T" or chain SDI cables together. The introduction of a connector distorts the signal quality leading to possible errors in the video.
- Pay attention to the "Check SDI cable" message in the new firmware. This indicates that the Gemini is detecting a CRC error in the video. A faulty cable is the most likely culprit.

Powering the Gemini

This is the most common Gemini issue, providing power with the correct voltage and polarity. As mentioned in the SSD section, adequate power (20 W) is critical for proper operation of the Gemini, particularly during record. So, here's a short list of recommended practices regarding power:

- Always double-check the polarity of the incoming power connection. Just like over-voltage, reverse-voltage will damage the internal power protection circuit requiring a return of the Gemini to the factory for repair. Shown below is the pin-out for the 4-pin Hirose power connector used in the Gemini.



1) Power: +6.5 ~ +19V
2) Power: +6.5 ~ +19V
3) Ground
4) Ground

Note: Positive Power must be connected to both Pins 1 & 2. Ground must be connected to both Pins 3 & 4.

- The Gemini power is rated to operate from +6V to +19V, never under any circumstances, exceed this voltage. The Gemini power is not directly compatible with the 3-pin RS power port from the ALEXA, which nominally outputs +24V. Likewise direct connection to a +28V battery will cause immediate damage to the Gemini voltage input protection circuit, necessitating an RMA return to the factory for repair.
- Be extra careful not to plug the power in the remote receptacle, located on the opposite side of the recorder. This will also cause a permanent failure, requiring a return to the factory for repair.
- Convergent Design offers a over-voltage/reverse-voltage protection module which mounts on the side of the Gemini and plugs into the power receptacle. This power module works by blocking the power to the Gemini 4:4:4 or nanoFlash if the voltage is over 19 Volts, or if the

polarity is reversed. When these conditions occur, zero volts will be provided to the Gemini or nanoFlash, thus protecting them from damage. If you would like to add this protection, the modules are available at no-charge, simply send a request to our customer support, tina@convergent-design.com.

- If the nanoFlash or Gemini 4:4:4 will not power up, check your cables for proper voltage and polarity. If you assume that the power protection module is defective, and connect your power cable directly to the Gemini 4:4:4 or the nanoFlash, and the power is bad, then you will damage the Gemini 4:4:4 or nanoFlash.

Convergent Design offers a DC to DC converter with a +10V to +34V input with a +8V @ 3A output to power the Gemini (also works on the nanoFlash). The converter also includes over-voltage/reverse-voltage protection. These converters will be available in September 2012 through authorized Convergent Design dealers.

RELEASE NOTES

Firmware Version 1.5.146
13-February-2013

Overview: This new firmware is a significant upgrade for the Gemini 4:4:4. With this new release, the Gemini 4:4:4 will be able to recover a clip that was being recorded when power is removed from the unit.

In other words, the Gemini 4:4:4 can now recover the last clip automatically from power failures.

Also, the variable amount of time that the Gemini 4:4:4 required to "Close" the files after a recording has been reduced to one second. Playback can start after this one second delay. Another recording can start in three seconds from the end of the previous recording.

These major enhancements require a change in operational procedures.

Now, when one is ready to remove SSD's from the Gemini 4:4:4, it is necessary to press the "SSD Safe Eject" icon on the unit.

If one removes an SSD without pressing this icon, then when the SSD is inserted into our Transfer Station, the clips will not be visible. A "Read Me" file will be present on the SSD as a reminder that clips are available but the SSD 1st needs to go through the Safe Eject procedure on the Gemini Recorder.
So if this does occur, one just needs to insert the SSD or SSD's into any Gemini 4:4:4 and then press the "SSD Safe Eject" icon.

1. SSD Safe Eject

Starting with this firmware release, prior to removing an SSD from the Gemini 4:4:4, one must first press the "SSD Safe Eject" Icon on the front of the Gemini 4:4:4.

The "SSD Safe Eject" icon updates the file system of the SSD. Unless this step is performed, the clips recorded on the SSD will not be visible to another computer system. Please refer to the notes above for additional information.
Please note: It is recommended that you record all clips on the Gemini 4:4:4 to a given SSD prior to performing an "SSD Safe Eject" on the SSD.

In other words: From the time a given SSD is formatted until the next time the SSD is formatted, it is preferable to record all clips and then perform a single "SSD Safe Eject" when you are ready to offload (upload to another device) all of the clips.

Removing an SSD without pressing the "SSD Safe Eject" icon will not cause any damage or loss of data whatsoever. It simply means the clips will not be visible to the computer until a safe eject is performed on the SSD.

This also means that it is perfectly safe to power a unit down with SSD's inserted
(and not ejected), and power the unit back up with the SSD's still inserted.

Of course, is it always preferable to not power down, or lose power while recording or playing back clips.

The "SSD Safe Eject" is a feature added to the Gemini 4:4:4 Recorder in Firmware versions 1.5.xx and later, as a means to improve SSD performance and longevity.

The “SSD Safe Eject” also allows for much faster closing of recording sessions on the Gemini Recorder (performed in one second, compared to a much longer time previously).

If an SSD Recovery fails, the files are not recognized by a computer,
or you receive an ERROR = 25, 7, 6, or 5:
Please power off the Gemini, repower, and wait 30 seconds and try the same procedure again.

---

2. **SSD Clip Recovery from Power loss during Record:**

In the event that a single clip needs to be recovered (such as if power is lost during a record session, or if an SSD is accidentally pulled out of the recorder during a record session):

In most cases the Gemini 4:4:4 will automatically detect that a given SSD has a clip that needs to be recovered, recover the desired clip, and present a status message indicating that the last clip was recovered.

If an SSD Recovery fails, the files are not recognized by a computer,
or you receive an ERROR = 25, 7, 6, or 5:
Please power off the Gemini, repower, and wait 30 seconds and try the same procedure again.

---

3. **SSD File System Recovery / Rebuild:**

In extreme cases (such as if a computer somehow corrupts the file system of an SSD), the user may initiate a complete file system recovery of an SSD on the Gemini 4:4:4 via the menu:

Gemini->SSD's->Recover SSD

This procedure will not erase or touch any video data on the SSD;
it will simply re-build the file system on the SSD.

One additional use of this option is to recover from a situation where a SSD is formatted in a Mac (not a PC) prior to the clips being uploaded to a computer.

In this case, just perform the Recover SSD procedure.

Please note that if one formats the SSD in a Mac and then the Mac writes files to the SSD, the Gemini 4:4:4 may not be able to recover all of the clips.

If an SSD Recovery fails, the files are not recognized by a computer,
or you receive an ERROR = 25, 7, 6, or 5:
Please power off the Gemini, repower, and wait 30 seconds and try the same procedure again.

---

4. **SSD Firmware Update:**

Firmware 1.5.146 will offer you the opportunity to upgrade the SSD internal Controller Firmware. This firmware controls how the SSD performs its internal functions.

- We recommend that you allow the Gemini 4:4:4 to perform this update at your earliest convenience.
- This is a critical update as it improves SSD performance and long-term stability.
- This is very desirable update provides substantial improvements in SSD reliability.

Upon insertion of an SSD, the Gemini 4:4:4 will detect whether an update is necessary, and prompt the user to update the SSD. This will only need to be performed once for each SSD, and takes less than 1 minute.

Ensure that:

- Before performing an SSD update, all important clips have been uploaded (saved).
- The Gemini Recorder has a stable power source while performing the SSD update.
- Ideally, perform the SSD update before doing any more recordings to that SSD.

If an SSD Recovery fails, the files are not recognized by a computer,
or you receive an ERROR = 25, 7, 6, or 5:
Please power off the Gemini, repower, and wait 30 seconds and try the same procedure again.

---

5. Expanded Support for Canon C500 Record / Playback

In this release the Gemini 4:4:4 now supports a wide range of the Canon C500 output formats for Record and Playback. The following formats are now supported:

For System Priority = "4K" on the C500:

- Canon Raw 4K (4096x2160) @ 23.98, 24, 25, 29.97 fps (requires two SSD's),
Canon Raw 4K (4096x2160) @ 50, 59.94 fps
(requires two recorders / four SSD's) (Files are recorded as Canon ".RMF" files)

- Canon Raw Quad HD (3840x2160) @ 23.98, 24, 25, 29.97 fps
(requires two SSD's),
Canon Raw Quad HD (3840x2160) @ 50, 59.94 fps
(requires two recorders / four SSD's) (recorded as Canon .RMF files)

- Canon Half-Raw 4K (4096x1080) @ 50, 59.94 fps (requires 2 SSD's), and
Canon Half-Raw 4K (4096x1080) @ 100, 119.9 fps
(accessed by enabling Slow/Fast on C500)
(requires two recorders / four SSD's) (Files are recorded as Canon ".RMF" files)

For System Priority = "2K" on the C500:

- RGB 4:4:4 1080P (1920x1080) 10-bit @ 23.98, 24, 25, 29.97, 50, 59.94 fps
  (29.97 and above requires two SSD's) (recorded as ".DPX" files)
  (1080p59.94 DPX recordings require Gemini Transfer utility to convert 10-bit "packed" to "un-packed" for editing)

- RGB 4:4:4 1080P 12-bit @ 23.98, 24, 25, 29.97 fps
  (25 and above requires two SSD's) (recorded as ".DPX" files)
  (all 12-bit recordings require Gemini Transfer utility to convert 12-bit DPX to 16-bit DPX format for editing)

- RGB 4:4:4 2K (2048x1080) 10-bit @ 23.98, 24, 25, 29.97 fps
  (29.97 fps requires two SSD's) (recorded as ".DPX" files)

- YCC 4:2:2 1080P @ 23.98, 24, 25, 29.97, 50, 59.94, 100, 119.9 fps
  (Recorded as 4:4:4 RGB for compatibility with industry standard software)
  (29.97 and above requires two SSD's) (recorded as ".DPX" files)
  (59.94p, 119.9 fps requires Gemini Transfer utility to convert 10-bit "packed" to "un-packed" for editing)

(YCC 4:2:2 1080P @ 100, 119.9 fps DPX requires two recorders / four SSD's, and is accessed by enabling Slow/Fast on C500)

Not supported at this time from the Canon C500:

- Canon Half-Raw Quad HD (3840x1080) @ 50, 59.94, 100, 119.9 fps
- C500 Slow/Fast: (Canon Raw) partially supported: only supported when the Slow/Fast Rate is set to the Maximum Rate and complies with the supported listings above, which includes 4K Half-Raw 50 fps cranked to 100, and 4K Half-Raw 59.94 fps cranked to 120 (119.9)
- C500 Slow/Fast (Canon DPX) (C500 System Priority = 2K or MXF): only supported when the Slow/Fast Rate is set to the Maximum Rate and complies with the supported listings above, which includes YCC 4:2:2 50 fps cranked to 100, and YCC 4:2:2 59.94 fps cranked to 120 (119.9)
- RGB 4:4:4 2K (2048x1080) 12-bit
- RGB 4:4:4 2K (2048x1080) 10-bit (50, 59.94, 100, 119.9 fps)
- RGB 4:4:4 1080p (1920x1080) 12-bit (50, 59.94 fps)
- YCbCr 4:2:2 1080i, 720p formats
- C500 Frame Record, Interval Record

Please note the following with regard to using the Canon C500 with the Gemini Recorder:

- If you wish to record DPX from the Canon C500 (meaning the C500's "System Priority" is set to 2K or MXF): *Ensure that the Gemini is set to Setup-> Mode-> DPX.*

- If you wish to record Canon Raw or Half Raw from the C500 (meaning the C500's "System Priority" is set to 4K): *Ensure that the Gemini is set to Setup-> Mode-> Canon Raw.*

- When in Camera Trigger for any Canon Raw or Canon DPX recordings,
  the Gemini Recorder will attempt to retrieve the base "Clipname" from the C500.
  The C500 must be recording internally simultaneously,
  in order for the Clip-name to be passed to the Gemini 4:4:4.

Note: When in Slow/Fast mode, the C500 does not record internally, and therefore does not provide a clip-name to the Gemini Recorder during record.
In this case the Gemini 4:4:4 will revert to its own clip-naming scheme, as set in the menu Record->Clip

- In instances where two recorders are required: *Simultaneous in-camera recording is needed to ensure proper clip-naming across two recorders.*
  Additionally the two recorders' dates must match, for proper clip-naming.

- In cases where the camera does not provide the clip-name to the Gemini 4:4:4 Recorders (such as in Slow/Fast): *Ensure that the two recorders' clip-name settings match, as set in the menu Record->Clip, since the Gemini will be recording the same clip across all four drives.*

- For Canon Raw, the Playback/Project rate is set by the Camera.

- For Canon DPX, the Playback/Project can be set in the Gemini Recorder menu Setup->Project->Frame Rate

6. Extended Clip-name option (Canon Raw only) (Record->ExtClip):

This menu option provides you with flexibility in Gemini 4:4:4 Clip Naming.

With this option not enabled, the Gemini 4:4:4 Clip names will more closely match the internal clip names, as recorded in the C500.

With this option enabled, the Gemini 4:4:4 Clip names will not match the internal clip names, but will have a Date and Camera Serial Number as part of the Clip Name, which provides extra protection against one reusing the same Clip Name.

We offer both options so you have the choice of which one suits your production best. If this option is enabled, and the C500 is providing the clip name to the Gemini 4:4:4 (which it does when simultaneous in-camera recording is taking place; while the Gemini is recording via Camera Trigger):

With **ExtClip** enabled:
the Gemini Recorder will create the clip names with the following structure:

AA000101_121031_0001_0000001.RMF

In which:

- the 1st 8 characters are provided by the C500 (to match the camera's internal recording clip name)
- the next 6 characters following "_" are year/month/day YY/MM/DD as set on the Gemini Recorder
- the next 4 characters following "_" are the last 4 digits of the camera serial number
- the next 7 characters following "_" are the frame counter digits.
- ".RMF" is the Canon Raw-specific file extension.

If **ExtClip** is disabled:
when the Gemini Recorder is retrieving the clip-name from the C500, the Gemini Recorder will create simpler clip names with the following structure:

AA000101_0000001.RMF

In which:

- The 1st 8 characters are provided by the C500 (to match the camera's internal recording clip name)
- The next 7 characters following "_" are the frame counter digits.
- ".RMF" is the Canon Raw-specific file extension.

7. SSD Smart Status:

Detailed SSD information such as expected SSD life is now available in the SSD information popup (accessible by pressing "SSD Info" tab and then pressing the SSD percent filled bar).

8. Expanded Tally Function: Green for "Record Ready", Red for "Recording"

Record Tally option in the menu (Outputs->Rec Tally):

When activated, this option is now expanded to include a "Green Tally Bar" indicator on the outputs when the Gemini Recorder is in a Record Ready state. And then as before, with this option activated while Recording, a "Red Tally Bar" is placed at the bottom of the monitor outputs.

Bug Fixes, Version 1.5.146

- From Canon C500, 4K Raw, fixed a bug in which the recorded data on the Gemini Recorder would on rare occasions have a random set of 5 pixels in a given frame which would be shifted a single pixel to the left or right. This tiny error in the video data was not visible or at worst barely visible to the naked eye. This has been fixed.
- Fixed a WAV audio issue that caused WAV files to not import.

Known Bugs, Version 1.5.146

- On rare occasions, when playing back recorded footage within the Gemini Recorder: the display will roll or shift the video and play in an odd fashion. The recorded video, however, is not effected and remains intact. Stopping and restarting Play fixes the display and outputs.
- On rare occasions, timecode can repeat from 1 frame to the next, and then is corrected thereafter.
- When recording Canon Raw Quad HD, after a Record session has ended the display on the Gemini Recorder will go black momentarily. This does not effect the recorded data or the functioning of the unit whatsoever.
- The message "Video Input Stream Errors, Check Cables" will normally appear when the Gemini Recorder sees errors in the incoming data stream, and may indicate insufficient cabling. However, sometimes this error message will inadvertently appear when changing video formats on the camera (especially the Canon C500). In such cases the message can be ignored.
- When attempting to set up a 1080p50 or 1080p59.94 RGB 4:4:4 input to the Gemini Recorder: if Dual-Link is required, the Gemini may not indicate this. The Gemini may show a single-Link as a valid 1080p25 or 1080p29.97 input.
- In this case, connect the 2nd link to achieve the desired 1080p50/59.94 input.
- When switching the Canon C500 from 2K to 1080p, the Gemini Recorder may not properly detect the input change. In this case pull and re-insert the input cable for the Gemini to get an accurate reading of the input.

Firmware Version 1.4.101
16-November-2012

1. **Formal Support for Canon C500 Record / Playback (as a purchased Upgrade):**

   The following modes are now supported for Record and Playback in the Gemini Recorder from the Canon C500:

   - Canon Raw 4K (4096x2160) @ 23.98, 24, 25, 29.97 fps (requires two SSD's),
     50, 59.94 fps (requires two recorders / 4 SSD's) (recorded as Canon .RMF files)
   - Canon Raw Quad HD (3840x2160) @ 23.98, 24, 25, 29.97 fps (requires two SSD's),
     50, 59.94 fps (requires two recorders / four SSD's) (recorded as Canon .RMF files)
   - Canon Half-Raw 4K (4096x1080) @ 50 and 59.94 fps
     (requires 2 SSD's but only one Gemini 4:4:4) (recorded as Canon .RMF files)
   - RGB 4:4:4 1080P 10-bit @ 23.98, 24, 25, 29.97 fps
     (29.97 and above requires two SSD's) (recorded as .DPX files)
   - RGB 4:4:4 1080P 12-bit @ 23.98, 24, 25, 29.97 fps
     (25 and above requires two SSD's) (recorded as .DPX files)
     (all 12-bit recordings require Gemini Transfer utility to convert 12-bit to 16-bit for editing)
   - RGB 4:4:4 2K (2048x1080) 10-bit @ 23.98, 24, 25, 29.97 fps
     (29.97 and above requires two SSD's) (recorded as .DPX files)
   - YCC 4:2:2 1080P @ 23.98, 24, 25, 29.97, 50, 59.94 fps
     (Recorded as 4:4:4 RGB for compatibility with industry standard software)
     (29.97 and above requires two SSD's) (recorded as RGB 4:4:4 .DPX files)
     (59.94p requires Gemini Transfer utility to convert 10-bit to “un-packed” for editing)

   To be supported in the near future:

   - Canon Half-Raw Quad HD (3840x1080) @ 50, 59.94 fps
     (requires 2 SSD's), 100, 119.9 fps (requires two recorders / four SSD's)
     (recorded as Canon .RMF files)
   - Canon Half-Raw 4K (4096x1080) @ 100, 119.9 fps
     (requires two recorders / four SSD's) (recorded as Canon .RMF files)
   - RGB 4:4:4 1080P 10-bit @ 50, 59.94 fps (requires 2 SSD's) (recorded as DPX files)
   - RGB 4:4:4 1080P 12-bit @ 50, 59.94 fps (requires 2 recorders / 4 SSD's) (recorded as DPX files)
   - RGB 4:4:4 2K (2048x1080) 10-bit @ 50 fps (requires 2 SSD's) (recorded as .DPX files)
   - All Slow/Fast rates, which include up to 120 fps for both Half-Raw (4K or Quad HD)
     and YCC 4:2:2 will be supported in the near future.
     However, for this release, do not use any of the Special Record options
     on the C500 (Slow/Fast, Frame Record, Interval Record) with the Gemini Recorder.

   Not supported:

   - RGB 4:4:4 2K (2048x1080) 12-bit : not supported at this time
   - RGB 4:4:4 2K (2048x1080) 10-bit (59.94, 119.9 fps) : not supported

*** In most, but not all cases, currently unsupported formats from the C500 will cause a “Not Supported” message on the Gemini Recorder. Do not attempt to record any formats from the Canon C500 not currently supported by the Gemini Recorder (as specified in the above listings), the results will be unpredictable in such cases. Also, ensure the C500's output matches the Input Status of the Gemini Recorder.

2. **Please note the following when using the Canon C500 with the Gemini Recorder:**
   - If you wish to record DPX from the Canon C500 (meaning the C500's “System Priority” is set to 2K or MXF) : ensure that the Gemini is set to Setup-> Mode-> DPX.
   - If you wish to record Canon Raw or Half Raw from the C500 (meaning the C500's “System Priority” is set to 4K) : ensure that the Gemini is set to Setup-> Mode-> Canon Raw.
   - When in Camera Trigger for any Canon Raw or Canon DPX recordings, the Gemini Recorder will attempt to retrieve the base Clipname from the C500. The C500 must be simultaneously recording internally, in order for the Clip-name to be passed to the Gemini Recorder.
   - In instances where two recorders are required: Simultaneous in-camera recording is needed to ensure proper clip-naming across two recorders. Additionally the two recorders' dates must match, for proper clip-naming.
   - For Canon Raw, the Playback/Project rate is set by the Camera.
   - For Canon DPX, the Playback/Project can be set in the Gemini Recorder menu Setup->Project->Frame Rate.

3. **Display of Activated Features in About menu :**

   The Activated (paid upgrade) features for a given Gemini Recorder are now shown in the About menu (Gemini->About).

4. **Updated Software Tools:**

   Software Tools have been updated:

   GeminiTransfer 1.2: in addition to 1080p60 and 3D 1080p30 un-packing, now supports all 12-bit DPX file un-packing to 16-bit (for editor / color corrector compatibility) .

   GeminiClipMerger 2.2: in addition to 2-folder merge from RAIDed Records, now supports 4-folder merge from Recordings which require 2 Recorders / 4 SSD's.

Bug Fixes / Other Workarounds

- ARRIRAW 4:3 23.98/24P Recordings are now recorded to one SSD, previously such recordings were split across two SSD's.
- Fixed bug with ARRIRAW Recordings, in which the timecode associated with the file, did not match the calculated timecode as part of the file name extension – the value was off by 1 or 2 sometimes. This has been corrected.
- With ARRIRAW Recordings, (using Camera Trigger on the Gemini Recorder), added ability to set the next Reel number when the Camera is passing “000” as the Reel number to the Gemini Recorder.
- When this happens now, the Gemini will revert to its own internal “Next Reel”, which behaves in a similar fashion as the Camera's “Next Reel” setting and can be edited in the Gemini menu Record->Clip->Next Reel, when applied.
- The Reel number for a given take is reflected in the 2nd, 3rd, and 4th characters of the clip-name, and can be noted in the “Next Take” field of the Gemini.

- With ARRIRAW Recordings, fixed bug in which the .ari files from the Gemini Recorder would appear in DaVinci Resolve with a frame rate of 16801.
- Improved detection of missing 2nd cable when in Dual-link with ARRIRAW input.
- With ARRIRAW high frame rate recordings (48P and above), the calculated timecode which is used for the file-name extension is now based on the Project Rate, not the Sensor Rate.
- With 3D DPX Recordings, a 29.97/30PSF signal is now accepted, whereas previously only a 29.97/30P signal (along with 23.98/24/25P or PSF) was accepted.

Please Note: With Firmware 1.3.105 or higher (which includes this firmware release), one must use an AC Powered Transfer Station, and not a USB-powered Transfer Station. USB-based power sources typically provide insufficient power and can damage the SSD's.

For those wanting to use Thunderbolt, Firewire 800 or USB 3.0, a Universal Transfer Station is available free of charge from Convergent Design. The USB 3.0 adapter is included, but the Thunderbolt or Firewire 800 adapters, if needed must be purchased separately.

Many professional users need an eSATA interface. This includes Mac Pro users that are not using USB 3.0. If you are currently using our original USB Powered eSATA Transfer Station, please discontinue its use to prevent damage to your SSD's.

Please request a free AC Powered eSATA Transfer Station from Convergent Design, if you need to use eSATA (and USB 3.0 or Thunderbolt is not available to you).

Also note that with very large Clips, the Mac may take up to several minutes to display the files folder of a given Clip, as it goes through an internal process of indexing the files, particularly for OSX Lion.

Known Issues, Version 1.4.101

- 3D DPX: occasional incorrect timecode values.
- 2K DPX RAIDed Recordings: will not play back correctly from the Gemini. If 1 SSD is removed, however, the other SSD will play back correctly.
- Using camera trigger w: start +
- Using Camera Trigger with Sony F3 with the Gemini: starts recording 8 frames after SYS.

Previous Firmware Releases

Firmware Version 1.3.105

23-October-2012

Beta (Demo) Support for Canon Raw from Canon C500:

- Beta support for record/play of Canon Raw @ 23.98, 25, 29.97, 50, and 59.94 fps, recorded as Canon .RMF files.
- QUAD HD (3820x2160) and 4K (4096x2160) are supported.
- Frame rates up to 29.97p require 2 SSD's for recording.
- 50p and 59.94p frame rates require 2 recorders and 4 SSD's for recording, due to the high data rate. For these rates the user must provide the source port from the C500 attached to a given Gemini Recorder ("3G-SDI1" or "3G-SDI2") via a Dialog on the Gemini Recorder. Simultaneous in-camera recording is needed to ensure proper clip-naming across 2 recorders.

  Additionally the 2 recorders' dates must match, again for proper clip-naming. Camera Trigger is also required (Record->Trigger).
- Canon Raw clips will use the naming convention "CLIP0001001_0000001.RMF" when used with triggers other than Camera Trigger (Record->Trigger), in which the clipname can be manually edited (in Record->Clip).

  When in Camera Trigger for any Canon Raw recordings, the Gemini Recorder will attempt to retrieve the base Clipname from the C500. The C500 must be simultaneously recording internally, in order for the Clipname to be passed to the recorder.

  With Camera Trigger, the following clip-naming convention is used (provided that simultaneous in-camera recording is taking place) : AA000101_121031_0001_0000001.RMF in which:
  - the 1st 8 characters are provided by the C500 (to match the camera's internal recording clip name)
  - the next 6 characters following "_" are year/month/day YY/MM/DD as set on the Gemini Recorder
  - the next 4 characters following "_" are the last 4 digits of the camera serial number
  - the next 7 characters following "_" are the frame counter digits.
  - ".RMF" is the Canon Raw-specific file extension.

- Other Canon C500 formats are not yet supported (2K DPX, 12-bit DPX, high frame rate DPX 100/120 fps, Half Raw 3840x1080, Half Raw 4096x1080).
- Canon Raw (Demo) can be used by selecting Setup-> Mode-> Canon Raw.
- Note that the GeminiClipMerger tool from Convergent Design can be used to combine clip folders which have been recorded across multiple SSD's, as is the case with all Canon Raw Recordings.

Frame Counter display during record:

Running Frame Counter during record shows number of frames that have been recorded to SSD's in the current record session.

Bug Fixes / Other Workarounds

- Fixed a bug recording from the ARRI ALEXA, in which the Gemini Recorder could get out of sync with respect to the Vari-Frame setting on the camera. The Gemini Recorder should now always correctly detect and follow the camera's Vari-Frame setting.
- Fixed compatibility with Mac OS Mountain Lion. SSD mounting and interaction with Finder was very sluggish, the interaction is now back to normal.

  Please note: It is imperative that only the Convergent Design Universal Transfer Station (in conjunction with a GoFlex or other compatible USB/Firewire/Thunderbolt adapter) is to be used for offloading data from an SSD to any computer. Do not use the original eSATA Transfer Station with the Convergent Design SSD's, as the original transfer stations are susceptible to damaging the SSD's under certain conditions.

  Also, be certain to use the Volume Safe Eject within Mac (Finder) and Windows (Safely Remove Hardware icon in bottom right of screen, if available) before pulling an SSD from the Transfer Station, after data has been offloaded. Pulling an SSD without using Volume Safe Eject on the Mac can damage the SSD!

- With a recent firmware upgrade, the Sony F3 camera now has 2 options for it's “SDI Rec Control”, which activates Camera Trigger to the Gemini Recorder.
  Please note that only the “HD SDI Remote I/F” option works properly with the Gemini. Do not use the “Synchro Rec” option!
- For using Vari-Frame with the ARRI ALEXA: please note the following:
  - If “Sensor Rate” on the ALEXA is set to 30 or less, set the “Record Out” to 30 or less as well’
  - Do not set the “Sensor Rate” to less than 1 on the ALEXA
  - Do not set the “Sensor Rate” on the ALEXA to 23.98 and the “Record Out” to 24
  - Do not set the “Sensor Rate” on the ALEXA to 29.97 and the “Record Out” to 30
  - “Sensor Rate” must be less than or equal to “Record Out” rate
- For this release, to boot into ARRIRAW or 3D DPX (via the Setup->Mode menu), a memory swap may be required, which will take about 1 minute. A dialog prompt will guide the user through this process.

Known Issues

- 3D DPX Recording: occasional incorrect values in timecode.
- Canon Raw Recording: occasional incorrect values in timecode.
- Canon Raw Recording: occasionally the last frame or 2 of a clip are unusable.
- If the Gemini Recorder is in Canon Raw mode, and a standard 1080p video input is attached to the Recorder (instead of a Canon Raw input) , an inappropriate message such as “Set Raw” will sometimes appear.

  In fact, in this situation the unit should be set to DPX (under Setup->Mode in the Menu) to record DPX from a standard 1080p input.

Firmware Version 1.3.100
22-October-2012

Beta Support for Canon Raw from Canon C500 :

- Beta support for record/play of Canon Raw @ 23.98, 25, 29.97, 50, and 59.94 fps, recorded as Canon .RMF files.
- QUAD HD (3820x2160) and 4K (4096x2160) are supported.
- Frame rates up to 29.97p require 2 SSD's for recording.
- 50p and 59.94p frame rates require 2 recorders and 4 SSD's for recording, due to the high data rate. For these rates the user must provide the source port from the C500 attached to a given Gemini Recorder ("3G-SDI1" or "3G-SDI2") via a Dialog on the Gemini Recorder. Simultaneous in-camera recording is needed to ensure proper clip-naming across 2 recorders.

  Additionally the 2 recorders' dates must match, again for proper clip-naming. Camera Trigger is also required (Record->Trigger).
- Canon Raw clips will use the naming convention "CLIP0001001_0000001.RMF" when used with triggers other than Camera Trigger (Record->Trigger), in which the clipname can be manually edited (in Record->Clip).

  When in Camera Trigger for any Canon Raw recordings, the Gemini Recorder will attempt to retrieve the base Clipname from the C500. The C500 must be simultaneously recording internally, in order for the Clipname to be passed to the recorder.

  With Camera Trigger, the following clip-naming convention is used (provided that simultaneous in-camera recording is taking place) : AA000101_121031_0001_0000001.RMF in which:
  - the 1st 8 characters are provided by the C500 (to match the camera's internal recording clip name)
  - the next 6 characters following "_" are year/month/day YY/MM/DD as set on the Gemini Recorder
  - the next 4 characters following "_" are the last 4 digits of the camera serial number
  - the next 7 characters following "_" are the frame counter digits.
  - ".RMF" is the Canon Raw-specific file extension.

- Other Canon C500 formats are not yet supported (2K DPX, 12-bit DPX, high frame rate DPX 100/120 fps, Half Raw 3840x1080, Half Raw 4096x1080).
- Canon Raw (Demo) can be used by selecting Setup-> Mode-> Canon Raw.
- Note that the GeminiClipMerger tool from Convergent Design can be used to combine clip folders which have been recorded across multiple SSD's, as is the case with all Canon Raw Recordings.

Frame Counter display during record :

Running Frame Counter during record shows number of frames that have been recorded to SSD's in the current record session.

Bug Fixes / Other Workarounds

- Fixed a bug recording from the ARRI ALEXA, in which the Gemini Recorder could get out of sync with respect to the Vari-Frame setting on the camera. The Gemini Recorder should now always correctly detect and follow the camera's Vari-Frame setting.
- Fixed compatibility with Mac OS Mountain Lion. SSD mounting and interaction with Finder was very sluggish, the interaction is now back to normal.

Please note: It is imperative that only the Convergent Design Universal Transfer Station (in conjunction with a GoFlex or other compatible USB/Firewire/Thunderbolt adapter), or AC-Powered ESATA Station, is to be used for offloading data from an SSD to any computer. Do NOT use the original USB-powered ESATA Transfer Station or any other USB-powered station with Convergent Design's SSD's, as the USB power does not always provide sufficient power, which can result in damage to the SSD's.

Also, be certain to use the Volume Safe Eject within Mac (Finder) and Windows (Safely Remove Hardware icon in bottom right of screen, if available) before pulling an SSD from the Transfer Station, after data has been offloaded. Pulling an SSD without using Volume Safe Eject on the Mac can damage the SSD!

- With a recent firmware upgrade, the Sony F3 camera now has 2 options for it's "SDI Rec Control", which activates Camera Trigger to the Gemini Recorder.
  Please note that only the "HD SDI Remote I/F" option works properly with the Gemini. Do not use the "Synchro Rec" option!
- For using Vari-Frame with the ARRI ALEXA: please note the following:
  - If "Sensor Rate" on the ALEXA is set to 30 or less, set the "Record Out" to 30 or less as well'
  - Do not set the "Sensor Rate" to less than 1 on the ALEXA
  - Do not set the "Sensor Rate" on the ALEXA to 23.98 and the "Record Out" to 24
  - Do not set the "Sensor Rate" on the ALEXA to 29.97 and the "Record Out" to 30
  - "Sensor Rate" must be less than or equal to "Record Out" rate
- For this release, to boot into ARRIRAW or 3D DPX (via the Setup->Mode menu), a memory swap may be required, which will take about 1 minute. A dialog prompt will guide the user through this process.

Known Issues

- 3D DPX Recording: occasional incorrect values in timecode.
- Canon Raw Recording: occasional incorrect values in timecode.
- On rare occasions, after a RAIDed record (record to 2 SSD's simultaneously), a "Mismatched SSD's for Record" message will appear, meaning that the 2 SSD's no longer have the required alignment to successfully accomplish further RAIDed recordings.
- If the Gemini Recorder is in Canon Raw mode, and a standard 1080p video input is attached to the Recorder (instead of a Canon Raw input) , an inappropriate message such as "Set Raw" will sometimes appear.

  In fact, in this situation the unit should be set to DPX (under Setup->Mode in the Menu) to record DPX from a standard 1080p input.

Firmware Version 1.2.110
14-September-2012

This Release replaces the recently posted Firmware 1.2.100.
It fixes clip naming of ARRIRAW records on the Gemini from an ARRIRAW camera (in conjunction with using "Camera" or "Timecode" Record Trigger on the Gemini). In Release 1.2.100, under certain conditions the clip-names from ARRIRAW records can be duplicated, causing an inability for computers to read the data correctly.

The following Features for Firmware 1.2.100 still apply.

Firmware Version 1.2.100
10-September-2012

IF YOU ARE UPDATING FROM FIRMWARE 1.0.54 TO THE NEW FIRMWARE, 1.2.100, PLEASE NOTE:
Any SSD to be used for recording with the new firmware will first require a fresh formatting within the Gemini Recorder (with the new firmware installed). Additionally, clips recorded with previous firmware may not play out of Gemini with newer firmware.

Features

- **3D Record and Playback Support**
  This release adds 3D Support to the Gemini 4:4:4. This is available in Demo Mode, with a permanent watermark in this release. The 3D Option is available, at extra cost, through your local dealer, allowing 3D Recording without the watermark.

  - The 3D Option supports 1080p23.976 (23.98), 24, 25, 29.97 and 30 (4:2:2 or 4:4:4 inputs). The Gemini must be in "3D DPX" mode to support 3D (Setup->Mode). 3D is not supported when recording ARRIRAW.

  - Two SSD's are required for 3D.
    - Two 256 GB SSD's may be used for most frame rates.
    - Two 512 GB SSD's are required for 1080p29.97 and 1080p30.

  - Each video stream, the "Left Eye" and "Right Eye", are recorded on separate SSD's.
    - SSD1 Clips and Files are appended with "_L", SSD2 Clips and Files with "_R" .

  - To enable 3D, the menu item is: **Setup->Mode-> 3D DPX.**

  - The 2 video sources must be gen-locked together and routed to the A and B ports

on the Gemini 4:4:4.

- Live/Playback 3D Combining options are available via menu items:
  - **Outputs-> LCD/A 3D**
    Controls 3D Combining for the LCD and HD-SDI Output A
  - **Outputs-> Out B**
    Controls 3D Combining for the HD-SDI Output B Separately

- Due to high data rates, the 29.97 and 30P rates are recorded as "Packed" (in 3D only), and require the Gemini Transfer Utility to un-pack (and simultaneously transfer) the data.

- Note: If **Camera Trigger** or **Timecode Trigger** is used as the **Record Trigger** with 3D, the Trigger is based on Port A only; i.e., the Gemini will only start and stop recording based on the Trigger activity of the Camera connected to Input Port A.

- Any audio is recorded from the SDI A (left) Input only, recorded to SSD 2. Embedded SDI Timecode I taken from SDI A (left) Input only, and recorded to both SSD's.

- **ARRI ALEXA ARRIRAW 4:3 Support**
  Our ARRIRAW Option originally only supported 16:9 Mode in the ARRI ALEXA Cameras. This firmware version adds ALEXA 4:3 Mode support to all ARRIRAW Option owners at no extra cost.

  - 4:3 Mode support adds the ability to record 4:3 in 23.976 (23.98) / 24 / 25 / 29.97 / 30 and 48 frames per second.

  - 16:9 Mode continues to allow recording up to 60 frames per second, which is the maximum supported by the ALEXA in 16:9 mode. In 4:3 Mode, the ALEXA's maximum is 48 frames per sec.

  - In 4:3 or 16:9 Modes, the image from the ALEXA, with all metadata, is recorded to the ".ari" files. In 4:3 Mode, a Desqueeze Option is available for confidence monitoring of the image via the internal LCD Monitor or external HD-SDI monitors.

  - The **Desqueeze** option is located in the Popup Menu (^) in lower right of screen. This is designed to work with the 2.0x Anamorphic lenses.

  - Both ARRIRAW 4:3 and 16:9 support is available in Demo Mode, (with a

watermark), or as an extra cost feature (included in the ARRIRAW Option) without the watermark.

- Menu Item: Setup -> Mode -> ARRIRAW

- **Project Frame Rate Support**
  With this release the Project Frame Rate can be set, which will be noted in the recorded file. This allows the Playback Frame Rate (the Project Frame Rate) to be different from the Video Input Frame Rate.

  For example, a video input with a rate of 59.94 Frames/Second can have a Project Frame Rate of 23.98, so that Playback from the Gemini (and Editing/Grading Software) will treat the recording as 23.98, thus causing the footage to be played back in slow motion, (with a 2.5x slow motion ratio).

  - Menu Item: **Setup->Project-> Frame Rate**

- **Remote Record Trigger**
  With this release the Remote Control Function of the Gemini 4:4:4 is now enabled. One can use a Remote Control Cable to Start/Stop the Gemini 4:4:4. Remote cables can be purchased from your dealer, or you can build your own.

  - **Remote Control Connector Pin Out**
    - 232 – RX
    - Remote, Do not use this pin, reserved, this is not for the Remote Control
    - LTC-I/O
    - GPI, Use this pin for the Remote Control Swtich
    - GND
    - 232 – TX

      To build a remote control, use a momentary switch, and connect to Pin 4 and Pin 5.
      Do not connect Pin 2 to Ground!

    - A momentary closure of the switch will start record. Hold the switch down for ½ second, then release to stop recording.

      - Menu Item: Record -> Trigger
  - **ARRI ALEXA Vari Flag Support**
    If the ALEXA **Vari Flag** menu option is on, and the ALEXA **Sensor Frame Rate** and **Rec Out Frame Rate** are set to different values, (with **Rec Out Frame Rate** set to a value less than **Sensor Frame Rate**), then the Gemini auto-detects that **Vari Flag** is enabled, and then only records the desired frames from the Camera, bypassing the frames that should not be recorded.

    A "**Vari Flag**" tag is displayed in the lower right corner of the screen when the Gemini detects **Vari Flag** from the Camera. Available for both Alexa HD (DPX) and ARRIRAW (.ari) Recordings.

> ***From the ARRI ALEXA User Manual***
>
> *"Vari flag: When set to "On", the Vari flag marks duplicate images in the HD-SDI stream. A recorder that supports the Vari flag can detect these frames and discard them. This makes sure that no duplicate frames are recorded if the HD-SDI is set to a higher*

- Note: There is no Gemini 4:4:4 Menu Item for the Vari Flag support.

  This is by design to ensure that the Gemini 4:4:4 automatically detects whether the ALEXA is outputting any flagged frames or not. This is to ensure that is shoot is not ruined by setting the option incorrectly, which would cause the loss of footage.

  Thus, just set the Vari Flag mode or not, in the ALEXA, as desired, and the Gemini 4:4:4 will automatically configure itself for proper operation, and preventing the possible loss of footage.

- Please allow video to be fed into the Gemini 4:4:4 for at least 10 seconds for the Gemini 4:4:4 do detect the change in the camera's setting.

- Live Preview on the Gemini of Vari-Frame data will not look as expected. The Gemini plays the last 1 second of captured Vari-Frame frames, so that the data will appear to repeat over a 1-second interval.

- **Time-Lapse Support**
  With this release, Time-Lapse is now supported in the Gemini 4:4:4. With Time-Lapse enabled, the Gemini 4:4:4 receives a continuous video feed from the camera, but only records one frame every 5 seconds, as specified by a menu option.
  - When Time-Lapse is desired, you will need to set the interval between frames to be recorded, in seconds, from 001 to 255, in the Time-Lapse menu, and also enable the Time-Lapse Feature.

  - A "Time-Lapse" tag is displayed in the lower right corner of the screen when Time-Lapse is turned on. This feature is available for any camera, recording in HD (DPX) or ARRIRAW.

    Recommendation: If people or animals are going to be filmed during the Time-Lapse Sequence, an interval of one second is typically best. Otherwise, people appear to jump from place to place.

    - Menu Items: **Record->Special->T-Lapse**

  - Live Preview on the Gemini of Time-Lapse data will not look as expected. The Gemini plays the last 1 second of captured Time-Lapse frames, so that the data will appear to repeat over a 1-second interval.

- **SSD Progress Bars**
  With this release, one can optionally display the SSD Progress Bars. These graphically display the space used / space remaining on each of the SSD's.

- To display these, just tap the **SSD Info** Icon on the upper left area of the Gemini 4:4:4 monitor. You may also tap the graphical display to bring up a Status Box with more specific information about each SSD.

- **Dual Link Video – Reversed Cable Protection**
  For Dual-Link inputs: if the inputs are reversed (Link A into Port B and Link B to Port A), recording will now be blocked and a message displayed alerting the user to the problem. This prevents the unit from recording when the input video is not valid, since the inputs were reversed.

- **Video Input Integrity Checks**
  The Video Input is now checked more closely for data integrity (via CRC checking). If data errors are occurring on the incoming video (due, for example, to a faulty cable), the user will be notified via a message displayed on the LCD screen.

- **Power Source Validation**
  If the Gemini 4:4:4 does not start recording, due to an inadequate power source, the Gemini 4:4:4 will shut down, and on subsequent power up, will display a message alerting the user of insufficient power. **Be sure to provide sufficient power to the Gemini 4:4:4!**
  - The regulated ALEXA 12 Volt Power Output (the 2-Pin Connector) is not adequate for powering the Gemini 4:4:4 and any other device simultaneously.
    This power source is adequate for powering the Gemini 4:4:4 by itself, but not two devices.

  - **Powering the Gemini 4:4:4 and a separate monitor will not work, will cause your recordings to fail, and may damage your SSD's. This is not an approved procedure.**

  - The same applies to powering the Gemini 4:4:4 and lens control motors from the ALEXA 12 Volt outputs, either the 2-Pin Lemo/Fischer or the Ext. connector.

- **Clip Merge Utility**
  Our Clip Merge Utility is now available.

- In certain high frame rates and modes, the Gemini 4:4:4 uses two SSD's, recording even numbered frames to one SSD and odd numbered frames to the second SSD.

  This new, free utility program, for both Mac and PC's, can be used to combine files from both SSD's. This utility is available on our website:

  http://www.convergent-design.com/Products/nanoFlash/Downloads.aspx

  The procedure is actually very simple, quick and efficient.

  1. Create a folder on your computer to receive the files from your SSD's.
  2. Copy the folders under the "}CLIPS{ folder from each SSD to the above folder.
  3. Run the Clip Merge Utility, specifying the location and name of the folder that you created in step 1 above.

     This will take under one minute.

     All of the files will be handled in such a manner as to combine the odd numbered frames and even numbered frames, just as if they were recorded to one SSD originally.

- **Optional Feature Protection**
  Optional features, such as ARRIRAW, or 3D, are enabled via a menu item where an Authorization Code for each specific optional feature is entered.

  - Once the codes have been entered, to prevent the accidental removal of the Authorization Codes, a simple password is now necessary to remove the Authorization Codes.
  - This is important to prevent the accidental deletion of an Authorization Code which may cause a disruption in your shooting.
  - This password protected process allows rental houses, for a given rental, to enable/disable certain features, as appropriate.
  - This helps each customer as a Gemini 4:4:4 without the extra features may rent for a lower amount, and this helps the rental house as only features actually rented may be used.
  - To disable an already Activated Paid Upgrade Feature, a simple password is now required. This password is available upon request from Convergent Design, ++720-221-3861.
  - Once an Authorization Code has been removed, the feature is no longer able to be used for production, (there will be a watermark in the images if it is

used).
- And, just by reentering the 8-Digit Authorization Code, the feature may be reactivated.

Bug Fixes

- Fixed a bug in which if the video source was lost during record, the Gemini Recorder would delay any action until the video source returned. The Gemini now, when the video source is lost, immediately ends the recording session with the Recorded Clip intact.
- Fixed a bug in which, when the special modes "Apply LUT" and "1:1 Pixel" (accessible through the "^" Popup Menu on the bottom of screen) were both applied at the same time, the video became distorted.
- Fixed a bug in which, under certain conditions, with Striped (Raided) Records, the file naming would get out of sync across the 2 SSD's and playback would be continuously stuttered. When this occurred, the frame numbers of the files were incorrect.
- Fixed a bug in which, on occasion, the audio recording was corrupted when recording ARRIRAW from the ARRI ALEXA.
- Fixed a bug in which a Striped (Raided) Record would on rare occasions result in the first several frames of video being corrupted.
- Fixed a bug in which, on occasion, with Striped (Raided) Recordings of ARRIRAW, the timecode would repeat across the two SSD's.
- LED dimming now displays more accurate colors.
  You may set the LCD and LED Brightness via Menu Item: **Gemini->Set->LCD->Brightness**

Known Issues / Limitations

- **Windows XP Warning**
  With 3D Recordings: do not use the Clips/Files on a Windows machine with Windows XP installed! Windows will frequently crash. *Only use Gemini 4:4:4's 3D Recordings with Windows 7 or later, or any Mac.*

- **Play / Stop**
  During playback of clips from the Gemini 4:4:4: the only functions available are "Play" and "Stop" (both functions are available via the Play/Stop button on the bottom of screen).
  At this time no other Play functions (such as Pause or Trick Play functions) are available.

- **HDMI Output and Analog Audio**
  The HDMI Output and Analog Audio Input and Headphone Output are not enabled at this time.

- **High Frame Rate Video Inputs (DPX) : 4:2:2 only**
  For DPX Recordings with high frame rate inputs (48,50,59.94, or 60p) : only 4:2:2 inputs are supported, not 4:4:4 inputs. The 4:2:2 input is up-converted and recorded as RGB 4:4:4 DPX. In other frame rates, both 4:2:2 and 4:4:4 inputs are supported.

- **Audio / Video Sync**
  May be off by up to 2 frames.

- **Loop Play of RAIDed Records**
  Loop Play of RAIDed Records is not functioning.

Firmware Version 1.1.2

Version 1.1.2 Features, 25-May-12

NOTE: Due to changes in formatting in the firmware release, any SSD to be used for recording with the new firmware will first require a fresh formatting within the Gemini Recorder (with the new firmware installed). Additionally, clips recorded with previous firmware may not play out of Gemini with newer firmware.

- Added “Camera” Record Trigger (Record > Trigger > Camera). This enables compatible cameras to send Record Start and Record Stop signals to the Gemini via the camera’s menu.
- Added support for 1080p29.97 and 1080p30 4:4:4 10-bit DPX recording. Recording is split (RAIDED) across two SSD’s (due to the high data rate), recorded at the full frame rate. The “Odd” numbered files are placed on SSD1 and the “even” numbered files are placed on SSD2. Any audio is placed on SSD2. Playback is from the two SSD’s at the full frame rate. Before editing, combine the two sets of files into a single folder when copying onto a computer to obtain the entire clip in a single, descending file format folder.
- Added support for 1080p50/59.94/60 4:4:4 10-bit DPX recording. Recording is split (RAIDED) across two SSD’s (due to the high data rate), recorded at the full frame rate. The “odd” numbered files are placed on SSSD1 and the “eve” numbered files are placed on SSD2. Any audio is placed on SSD2. Playback is either combined from both SSD’s at half speed (by choosing the “RAID” checkbox in the Playlist) with no audio, or played as just the “even” frames (SSD2, with audio) or “odd” frames (SSD1, no audio) at regular speed. Before editing, combine the two sets of files into a single folder when copying onto a computer, to obtain the entire clip in a single folder. (For 1080p59.94/60 two 512 GB SSD’s required.)
- Due to the high data rate of 1080p59.94/60 DPX files, the DPX data is stored as “packed”. To un=pack the data (required for compatibility with most computer software), use our free un-packing tool, Gemini Transfer, available on our website on the Downloads page. All other DPX formats are recorded as un-packed on the Gemini, and are directly accepted by all DPX compatible software. Both packed and un-packed DPX data retain full quality.
- Convergent Design has received formal ARRI Certification, and added support for ARRIRAW recording and playback for ALEXA Series cameras (16:9). Support includes:
    - Recording ARRIRAW progressive video formats at p23.98/24/25/29.97/30 (.ari) to single SSD (frame counter for files is based on the timecode), 2-channel audio recorded as .wav (if audio is present on the incoming SDI stream).
    - Recording ARRIRAW progressive video formats at p48/50/59.94/60 (.ari). Two SSD’s are required.as data files alternate between two SSD’s (frame counter for files is based on the timecode). No audio is available for p59.94/60.
    - Playback of ARRIRAW.
    - Support for Gemini “Camera” Record Trigger setting with ALEXA (on ALEXA: Menu > Recording > Rec Out > SDI Remote > set to On).

  - In the Gemini's "Camera" Trigger and "Timecode" Trigger modes: Gemini clips follow the same naming convention as the ALEXA internal recording, provided that the Date (year/month/day) on the ALEXA and the Gemini match exactly (Date is set separately on the ALEXA and the Gemini).
  - A limited amount of ALEXA settings are available for viewing on the LCD Screen of the Gemini during Live Preview, including Shutter Speed, Exposure Index, White Balance, and Color Correction.
  - A limited amount of ALEXA Metadata is available for viewing in the Gemini Playlist including Location and Take.
  - ARRIRAW is in LOC C format. A generic LUT may be applied to the incoming video (for viewing only, not applied to the recorded video) by selecting the "Apply LUT" option in the Pop-up menu of the Gemini.
  - If recording at high frame rates (p48 and above) across two SSD's: combine the two sets of files into a single folder before editing, to obtain the entire clip of a given recording.
  - Activated ARRIRAW feature can be disabled / enabled (see Disable ARRIRAW, page 10).
- ARRIRAW is available to all Gemini Users in Demo Mode. A gray bar appears across any recording. To activate ARRIRAW for Production Use:
  - Purchase the ARRIRAW Upgrade from your local Dealer.
  - On the Gemini, go to Gemini > Set > Keys > Raw
  - With an SSD inserted into Slot 1, enter value "10000000" (eight-digit) for the Raw Key; press "OK".
  - A Unit ID File is written to the SSD. Save this file to your computer.
  - Upon receipt of the ARRIRAW Upgrade order, Convergent Design will contact you to obtain necessary contact information and the Unit ID File. This information is used to process your unique Activation Key.
  - The ARRIRAW Activation Key will be sent to be entered into the Raw Key field and activate the ARRIRAW feature on the Gemini 4:4:4.
- Convergent Design is phasing out the original Transfer Station (eSATA), and replacing it with a Universal Transfer Station Adapter (available June 2012). While this adapter is provided with the unit, it is intended for use with the Seagate FreeAgent GoFlex Adapter, which is available as Thunderbolt, Firewire, or USB).
  - If using the Thunderbolt adapter you must un-plug and re-plug the Thunderbolt cable from the adapter each time an SSD is inserted, in order for the computer to recognize the SSD.

  Only use Convergent Design provided transfer stations, do not use any other such adapter, when offloading video through the GoFlex Adapters.
- A Pre-Activation File is written to the SSD, email this file along with Proof of Purchase to cd support @ convergent-design .com. An Activation Key will be emailed back, enter this key into the Raw Key field to activate the ARRIRAW feature on the Gemini.
- Fixed bug in which the number of audio samples recorded did not correspond precisely with the number of video frames recorded (audio was off by 1 to 3 seconds). The audio file recorded now has the correct number of samples with respect to video frames recorded.
- Fixed bug in the Unit Activation Key calculation (Activation Key is acquired and entered as part of the unit registration process).
- Added option to clear Metadata fields back to default values (Gemini > Set > Reset > Metadata).
- Added a partial (50%) dimming of LCD Screen during Record to help conserve power usage and reduce temperature.

- All SSD space is now pre-allocated when formatted on the Gemini, meaning no free space is available on a computer. This changes the update procedure for the Gemini, for future updates:

NEW FIRMWARE UPDATE PROCEDURE (for future updates, post-v1.1.2)

1. Format an SSD on the Gemini
2. Take to computer, delete the "SANDBOX" file from the SSD
3. Copy the new firmware onto the SSD
4. Insert the SSD back to the Gemini and follow the prompt to update the firmware
5. After updating, return the SSD to the computer and delete the firmware update
6. Format the SSD again on the Gemini for recording
7. NOTE: We recommend never to delete the "SANDBOX" file or any files from an SSD on a computer, unless you are loading a firmware update or other essential file from the computer to the SSD.

- Added a "Format Both" option to format (erase) both SSD's (Gemini > SSD's > Format Both).

We also recommend never to use the Convergent Design SSD's for general purpose usage on a computer – only use the SSD's for offloading video recorded on the Gemini (or for transferring firmware updates or other essential files to the Gemini from a computer).

Known Issues / Limitations

- During playback of clips from the Gemini Recorder: the only functions available are "play" and "Stop" (both functions are available via the Play/Stop bottom on the bottom of the screen). At this time no other Play functions (such as Pause or Trick Play functions) are available.
- HDMI Output and Analog Audio Input are not functioning at this time.
- Single-link video inputs must be attached to the "SDI A In" port on the Gemini.
- When using Timecode Trigger as the Record Trigger, repeated timescodes may be experienced on the final 2 or 3 frames of a given recording.
- The "Apply LUT" option only applies to 4:4:4 or RAW inputs. "Apply LUT" does not work in 1080p50/60 DPX or any 4:2:2 single source.
- 1080p48 DPX is not supported at this time
- Video may shift when formatting SSD's.
- 3D is not enabled at this time.
- Files recorded with previous firmware on the Gemini may not play out of Gemini that has newer firmware.
- Playback may not work properly from SSD's with mixed video formats. Additionally, playback may not work properly if a video input is present at the time of Play, which is different from the recorded material's video format.

Version 1.0.594 Features, 10-Feb-12

- Added support for 1080p 24.00 frame rate (in addition to the already supported 1080p23.98 and 1080p25). Additionally, 1080p23.98 is reported more precisely as 23.98 in the Input Status window of the LCD screen.
- The DPX file naming convention was changed:
    - For the character preceding the frame counter digits, we replaced the "." with a "_"
    - Files now begin at "0000000" instead of "0000001", and count forward as before.
      Example: For a clip named CLIP0000001, the DPX files will be named:

      CLIP0000001_0000000.DPX
      CLIP0000001_0000001.DPX
      CLIP0000001_0000002.DPX …etc.

- Fixed Outputs: Mode setting to be correctly saved when the setting is changed.
- Added a "Next Take" info button on the left side of screen, which when chosen displays the Clip, Scene, and Take which will be used for the next recording. (Please refer to the Metadata discussion below).
- Fixed bug in which timecode would inappropriately repeat or skip from one DPX file to the next within a recording.
- Fixed rare (0.000001%) pixel repetition within video frames.
- Lessened the sensitivity of scroll buttons when scrolling and adjusting values on the LCD screen.
- Added Support for CineFlex cameras with earlier firmware versions that do not comply with SMPTE Specs. Dual-link HD-SDI signals will now be recognized appropriately from these cameras.
- Added Metadata functionality:
    - Metadata may be entered and edited through the "Metadata" tab along the left side of LCD screen (in Live/Rec Mode).
    - The "Scene" and "Take" fields (along with the Clip Name) for the next recording are displayed just above the timecode display, which is located along the bottom row of the LCD screen, when the "Next Take" info button is selected (on the left bottom of LCD).
    - During Record, Metadata is saved in various locations within the header of every DPX file (the Metadata within the DPX header is viewable within some software programs on a computer), and additionally the Metadata is stored in a separate XML file (alongside the DPX files for a given recording).
    - Also, the Metadata is stored, within the DPX header:
- the "Reel", "Scene", "Take", and "Day" values are placed in the "Slate Info" defined field in the DPX header
- the "Reel" value is additionally placed in the "Input Device Name" field of the DPX header
- the "Camera" value is placed in the "Input Device Serial Number" field of the DPX header
- the "Project" value is placed in the "Project" field of the DPX header
- Most Metadata is displayed for each clip in the Play List (in "Play/Review" mode on the Gemini Recorder). This includes Scene, Take, Timecode, Date, Time, and Shooting Day.
- Added 2-channel audio support over SDI, recorded as WAV files (and placed alongside the DPX files for a given recording). WAV file will only be produced if audio is present over the incoming SDI stream during record.
- Added Play List / Play Selection functionality:

  - Clips may be selected for Playback out of the Gemini via the "Play List" tab along the left side of the LCD screen (in Play/Review mode).
  - All selected clips will be played in sequence, and optionally the playback will loop continuously (if the "Loop" option is selected), until manually stopped.
  - The default behavior of the Play List is to play and loop the last recorded clip.
- Added Screen Flip function (Gemini->Set->LCD->Flip) to flip the Video and On-Screen Display by 180 degrees. This is to allow more flexibility of mounting the Gemini 4:4:4, as it can now be mounted upside down, while still viewing the image and menus in the upright position. This does not flip the recorded image. Flipping of the recorded image will come with the 3D Option.
- Added LCD Screen / LED Brightness setting (Gemini->Set->LCD->Brightness) :
  20% to 100% Brightness, adjustable in 10% increments.
- Added LTC timecode input source (via remote port and adaptor cable) (Inputs->Timecode->Source).
  - LTC Timecode may be used in conjunction with the Record->Trigger->Timecode setting to start and stop recordings on the Gemini (via incrementing Timecode for starting record, and stopped Timecode for stopping record), in the same manner as with Embedded SDI Timecode.
- Added current time/date display via the System Status button (lower left corner of LCD touch-screen, press button to bring up a larger System Status Info box).
- Beta support for 3G video inputs is included in this release.

  NOTE: Due to the addition of audio files, XML files, and Play List in this firmware release, any SSD to be used for recording with the new firmware will first require a fresh formatting within the Gemini Recorder (with the new firmware installed). Additionally, for any SSD's containing clips recorded on previous firmware, the Gemini Recorder will not provide a Play List for these clips – the only Play function will be "Play All". In order to play clips recorded with earlier firmware, you must select the "All" function in the Play List, and insert SSD's with the older clips only after powering the unit.

Known Issues – 1.0.594

- During playback of clips from the Gemini Recorder: if the "Loop" option is selected, the video/audio can get out of sync with respect to each other over time. Additionally during "Loop" play, the audio may disappear altogether. These are only limitations of the "Loop" play; the actual recorded video/ audio files are intact and in sync.
- During playback of clips from the Gemini Recorder: the only functions available are "Play" and "Stop" (both functions are available via the Play/Stop button on the bottom of screen). At this time no other Play functions (such as Pause or Trick Play functions) are available.
- During playback: on rare occasions, the video can shift vertically. Restarting the Play will correct the video shift. This is only present while playing from the Gemini; the actual recorded video files are intact.
- HDMI Output and Analog Audio Input are not supported at this time.
  (Future firmware release).
- Single-Link video inputs must be attached to the "SDI A In" port on the Gemini.
- When using Timecode Trigger as the Record Trigger, repeated timecodes may be experienced on the final 2 or 3 frames of a given recording.
- For the Metadata fields, no method exists to clear these fields back to default values.
- Firmware Version 1.0.105 drives cannot be recorded to with firmware version 1.0.594.
- Copying files to SSD's from a computer source for playback is not supported.

Canon 4K Cinema Raw Support

	Format	Frame Size	Frame Rate (fps)	Data Sampling	Bit Depth	SSD DataRate (MB/Sec)	File Format (on SSD)	Record Time (Minutes) ***	No. of Gemini's Required	No. of SSD's Required *	SSD Data Packed **	SSD Transfer Time in Seconds for 60 Seconds of Recording ****		Gemini Mode	Cabling
												USB 3.0	Thunderbolt		
HD 10-Bit	HD - 1080p	1920x1080	23.98/24	RGB 444	10-Bit	200	dpx	83	1	1	No	60	34	DPX & 3D *****	3G SL
	HD - 1080p	1920x1080	25	RGB 444	10-Bit	208	dpx	80	1	1	No	62	36		
	HD - 1080p	1920x1080	29.97/30	RGB 444	10-Bit	233	dpx	72	1	2	Yes	70	40		
	HD - 1080p	1920x1080	50	RGB 444	10-Bit	388	dpx	43	1	2	No	116	67	DPX	3G DL
	HD - 1080p	1920x1080	59.94/60	RGB 444	10-Bit	466	dpx	36	1	2-512GB	Yes	140	80		
	HD - 1080p	1920x1080	23.98/24	YCC 422	10-Bit	200	dpx	83	1	1	No	60	34	DPX & 3D *****	3G SL
	HD - 1080p	1920x1080	25	YCC 422	10-Bit	208	dpx	80	1	1	No	62	36		
	HD - 1080p	1920x1080	29.97/30	YCC 422	10-Bit	233	dpx	72	1	2	Yes	70	40		
	HD - 1080p	1920x1080	50	YCC 422	10-Bit	388	dpx	43	1	2	No	116	67	DPX	
	HD - 1080p	1920x1080	59.94/60	YCC 422	10-Bit	466	dpx	36	1	2-512GB	Yes	140	80		
	①HD – 1080p	1920x1080	100	YCC 422	10-Bit	778	dpx	43	2	4	Yes	233	133		
	①HD - 1080p	1920x1080	119.88/120	YCC 422	10-Bit	933	dpx	36	2	4	Yes	280	160		
HD 12-Bit	HD - 1080p	1920x1080	23.98/24	RGB 444	12-Bit	225	dpx	74	1	1	Yes	68	39	DPX	3G SL
	HD - 1080p	1920x1080	25	RGB 444	12-Bit	235	dpx	71	1	2	Yes	71	40		
	HD - 1080p	1920x1080	29.97/30	RGB 444	12-Bit	282	dpx	59	1	2	Yes	85	48		
	HD - 1080p	1920x1080	50	RGB 444	12-Bit	468	dpx	36	1	2	Yes	140	80		3G DL
	HD - 1080p	1920x1080	59.94/60	RGB 444	12-Bit	562	dpx	59	2	4	Yes	169	96		
2K 10-Bit	2K	2048x1080	23.98/24	RGB 444	10-Bit	213	dpx	78	1	1	No	64	37	DPX	3G SL
	2K	2048x1080	25	RGB 444	10-Bit	222	dpx	75	1	1	No	67	38		
	2K	2048x1080	29.97/30	RGB 444	10-Bit	250	dpx	67	1	2	Yes	75	43		
	2K	2048x1080	50	RGB 444	10-Bit	444	dpx	38	1	2	No	133	76		3G SL
	2K	2048x1080	59.94/60	Not Supported											
	2K	2048x1080	100	YCC 422	10-Bit	888	dpx	38	2	4	Yes	266	152		3G DL
	2K	2048x1080	119.88/120	Not Supported											
2K 12-Bit	2K	2048x1080	23.98/24	RGB 444	12-Bit	239	dpx	70	1	1	Yes	72	41	DPX	3G SL
	2K	2048x1080	25	RGB 444	12-Bit	250	dpx	67	1	2	Yes	75	43		
	2K	2048x1080	29.97/30	RGB 444	12-Bit	300	dpx	56	1	2	Yes	90	51		
	2K	2048x1080	50	RGB 444	12-Bit	500	dpx	67	2	4	Yes	150	86		3G DL
	2K	2048x1080	59.94/60	RGB 444	12-Bit	600	dpx	56	2	4	Yes	180	103		
Quad HD Raw	Quad-HD	3840x2160	23.98/24	Raw	10-Bit	250	rmf	67	1	2	No	75	43	Canon Raw	3G SL
	Quad-HD	3840x2160	25	Raw	10-Bit	261	rmf	64	1	2	No	78	45		
	Quad-HD	3840x2160	29.97/30	Raw	10-Bit	313	rmf	53	1	2	No	94	54		
	Quad-HD	3840x2160	50	Raw	10-Bit	522	rmf	64	2	4	No	157	89		
	Quad-HD	3840x2160	59.94/60	Raw	10-Bit	626	rmf	53	2	4	No	188	107		
Q-HD Half Raw	QHD Half	3840x1080	50	Raw	10-Bit	261	rmf	64	1	2	No	78	45	Canon Raw	3G SL
	QHD Half	3840x1080	59.94/60	Raw	10-Bit	313	rmf	53	1	2	No	94	54		
	QHD Half	3840x1080	100	Raw	10-Bit	522	rmf	64	2	4	No	157	89		
	QHD Half	3840x1080	119.88/120	Raw	10-bit	626	rmf	53	2	4	No	188	107		
4K Raw	4K	4096x2160	23.98/24	Raw	10-Bit	267	rmf	62	1	2	No	80	46	Canon Raw	3G SL
	4K	4096x2160	25	Raw	10-Bit	278	rmf	60	1	2	No	83	48		
	4K	4096x2160	29.97/30	Raw	10-Bit	333	rmf	50	1	2	No	100	57		
	4K	4096x2160	50	Raw	10-Bit	556	rmf	60	2	4	No	167	95		
	4K	4096x2160	59.94/60	Raw	10-Bit	666	rmf	50	2	4	No	200	114		
4K Half	4K Half Raw	4096X1080	50	Raw	10-Bit	278	rmf	60	1	2	No	83	48	Canon Raw	3G SL
	4K Half Raw	4096x1080	59.94/60	Raw	10-Bit	333	rmf	50	1	2	No	100	57		
	②4K Half Raw	4096x1080	100	Raw	10-Bit	556	rmf	60	2	4	No	167	95		
	4K Half Raw	4096x1080	119.88/120	Raw	10-bit	666	rmf	50	2	4	No	200	114		

* If 2 or More SSD cards are required, use the Gemini Clip Merge Utility.

** If 'YES', use Gemini SSD Transfer Program for Off-load.

*** Record times assume all slots filled with 512 GB SSD's. IE, max recording time.

**** Assumes USB 3.0 transfer rate = 200MB/sec; Thunderbolt = 350MB/sec.

*****3D Support for C500: 23-30p supported firmware 1.4.101, future release to support 1080p 12-Bit23.98/24, and 2K 23.98/24/25p, NEVER support 2K 29.97/30p

QHD Half is Quad HD with half the vertical resolution. 4K Half Raw has half the vertical resolution of 4K Raw.

The recorded frame size is 3840x1080, but the debayered frame size is 3840 x 2160 for ease in editing.

The recorded frame size is 4096x1080, but the debayered frame size is 4096 x 2160 for ease in editing.

① No Slow Fast Support in DPX ② Only in 50p System Frequency

This chart represents Gemini 4:4:4 support of Canon C500 and Cinema Raw. Items in gray will be released separately at a later date.

Trouble Shooting & Support

Please read the User Manual before contacting support. We highly recommend that you follow these steps:

(1) **UPDATE YOUR GEMINI**: Visit the Gemini 4:4:4 Firmware Updates page on the website and confirm that you are running the latest version. Please refer to 'Firmware Updates' on page 22 for more about checking the system for current version and updating.
http://www.convergent-design.com/ProductUpdates/Gemini444.aspx

(2) **VISIT OUR FORUM**: We have a very active forum and you may find the answer you are looking for, as well as support from the Convergent Design community.
http://www.dvinfo.net/forum/convergent-design-nanoflash/

(3) **REFER TO DOCUMENTATION**: Please read all of this User Manual, as well as our Gemini 4:4:4 FAQs which document basic usage and help answer common questions.

(4) **CONTACT US:** If you still haven't found a solution to your support needs we are always happy to help you 24/7!

Support E-Mail: cdsupport (at) convergent-design .com
Sales E-Mail: cdsales (at) convergent-design .com
Main Telephone: ++(720) 221-3861
Sales and After Hours Support Telephone: ++ (719) 930-1376, ++803-278-0941
Web Site: http://www.convergent-design.com & www.Gemini444.com

We appreciate your questions, comments, feedback! We ARE listening! To reach out to us, look for this link on our website, or visit http://www.convergent-design.com/ProductUpdates/WereListening.aspx

Limited Warranty

Convergent Design warrants Gemini 4:4:4, and all included accessories, against defects in material and workmanship for a period of 2 years (for registered units), 1 year (for non-registered units), and 3 months (for units used as rentals) from the original date of purchase.

Convergent Design disclaims all other warranties.

Convergent Design will not be liable for damages of any kind, including, but not limited to, compensation or reimbursement on account of failure of the unit, or any of its accessories, or its recording media, external storage systems, or any other media or storage systems to record or playback content of any type. Also Convergent Design will not be liable for a failure of the unit to properly record or play back for any reason. Convergent Design's total liability, in all cases, is limited to the actual purchase price.

If you discover a defect, please refer to our Return Merchandise Policy below.

During the warranty period, Convergent Design, at its option, will repair or replace product or product components, which in its opinion prove defective, provided the unit is returned, freight charges prepaid, to Convergent Design. Parts and components used in the repair process may be recycled or repaired, at Convergent Design's sole discretion. This warranty service will be performed at no charge to the registered owner, provided the product is shipped prepaid to Convergent Design.

Convergent Design reserves the right to determine whether a needed repair is subject to the warranty as per its provisions stated herein. Transit damage caused by inadequate packing violates the warranty. The warranty will be void if, in the opinion of Convergent Design, the product has been damaged through accident, misuse, misapplication, or as a result of service or modification not authorized in writing by Convergent Design.

Opening the unit and breaking the warranty seals, voids the warranty, unless specifically authorized in advance by Convergent Design.

WARNING: THE FOLLOWING ARE NOT COVERED UNDER WARRANTY, AND ARE ITEMS FOR WHICH CONVERGENT DESIGN DOES NOT ACCEPT ANY RESPONSIBILITY:

- Damage due to the use of an AC power supply, other than the one supplied, or use of any inappropriate power source.
- Damage due to overheating conditions. The unit will attempt to shut down, if powered on, in the event of overheating, before damage can occur.
- Damage due to exposure to water, or other liquids, or excessive dust or sand.
- Damage caused by dropping or other rough handling.

- Damage caused by any overvoltage conditions or reverse voltage conditions.
- Any physical damage to the LCD and/or Touch Screen including scratches.
- Damage to any connector by using excessive force or rough handling.
- Any loss or corruption of video or audio data recorded on the unit, or any loss or corruption of data which is in any way associated with the Gemini 4:4:4.

Obtaining an RMA

It is our policy that all material and repair returns, whether in warranty or not, are only accepted if an RMA (Return Merchandise Authorization) Number has been issued for the products being returned.

E-mail Convergent Design at cdsupport (at) convergent-design .com to obtain an RMA number for a faulty unit, or call ++720-221-3861 (7:30 am to 5 pm Colorado, USA time).

Items must be returned within 15 days of receiving your RMA number.

Returned product must be securely packaged and must have the RMA number clearly marked on the outside of the package.

RMA numbers and return address may be obtained from Technical Support.

Convergent Design RMA # _____

4465 Northpark Drive, #400

Colorado Springs, CO 80907

EMAIL: cdsupport@convergent-design.com

WEBSITE: www.convergent-design.com or www.gemini444.com

Phone ++(720) 221-3861 (Preferred, Mountain Time) or
++(866) 654-0080 or
++(803) 278-0941 (For After Hours Support 24/7)
++(719) 930-1376 (For After Hours Support 24/7)

Transit damage caused by inadequate packaging also invalidates the warranty agreement.

Please ship the unit in its original packaging, if possible.

Within the United States, the unit may be shipped directly to Convergent Design once an RMA is obtained.

Outside the United States, please coordinate with your dealer, which will then coordinate with our distributor for your part of the world. Our goal is to ensure that the units are shipped properly and that the units will clear customs without incurring extra charges. In some cases your local dealer or distributor may be able to provide you with a loaner unit.

All products must be shipped prepaid to Convergent Design, or preferably through the dealer from which the unit was purchased (if outside the US). If you purchased the unit from a dealer outside of your normal trading zone, then you may be charged for return shipping to your location.

For insurance reasons, Convergent Design cannot accept any product that is returned via U.S. Postal Service. Returns will be accepted from Federal Express, UPS, DHL, or other comparable freight carrier.

Products repaired out-of-warranty are shipped at customer's expense.